ARCHIVES OF OPHTHALMOLOGY.

A SIMPLIFIED METHOD OF EXTIRPATION OF THE LACHRYMAL SAC.

By Dr. C. BARCK, St. Louis.

(With three illustrations on Text-Plate II.)

Synopsis.—The incision is made mesially to the insertion of the internal palpebral ligament, directly down to the bone. The lachrymal sac is detached from the bone by curved elevators, and loosened all around by a curved hook. It is then severed at the entrance into the nasal duct. Then it is forcibly drawn down and out and the excision completed.

THE incision commences *2mm* above, and just mesially to the insertion of the internal palpebral ligament, which is an easy landmark. It is, as usually, about *1.5cm* long, and slightly curved. It is carried directly through the soft tissues and the periosteum to the bone. By making this incision more mesially than is ordinarily recommended, it can begin at the mentioned high point without injuring the ligament. If made more temporally, it is necessary either to sever the latter or commence the incision below it. In the first instance, disfigurement is likely to follow; in the second, the space is too limited for an easy removal of the cupola of the sac. The incision will strike the slight groove in front of the crista of the nasal process of the superior maxilla. The hemorrhage, which is frequently encountered now, the greatest during the entire operative procedure, comes from one of the larger blood-vessels running down the nose, and can easily be controlled by one or two artery forceps.

As wound retractors, I have tried the different self-retaining specula and have arrived at the conclusion that the old-fashioned hooks are superior. The former fall out too easily and thereby cause delay. In the absence of sufficient assist-

ance they are of course of value; but where there is no want of such, the hooks are preferable. As a rule, one only is necessary to draw the temporal wound-lip away; the mesial one retracts somewhat spontaneously.

The orientation from now on is not difficult. Just temporally to the incision through the periosteum is the crista of the superior maxilla, and immediately beyond this is the fossa lacrymalis, in which the sac is located. In order to facilitate the orientation still more, a probe may be introduced through the slit upper canaliculus into the entrance of the nasal duct either now, or before the commencement of the operation. This step, valuable for the beginner, is hardly necessary for the experienced operator.

The dissection of the sac commences with its detachment from the lachrymal bone (Fig. 1), the wall of the sac and the periosteum being there one and the same. For this purpose I use two small periosteal elevators, a bent one during the first part and a half curved one later on. Finally I encircle the sac with a curved hook (Fig. 2), dividing the tissues without cutting. The instrument I use is similar to a small strabismus hook, only more curved. After the lower portion of the sac has thus been entirely freed, it is severed with scissors as close to the entrance into the nasal duct as possible. If a probe had been previously introduced, it is of course withdrawn before this step.

Then the lower end of the sac is firmly secured with a strong forceps and forcibly drawn down and outward (Fig. 3). The remaining dissection of the sac, especially of the upper portion, the cupola, which offers the main difficulty, is rendered very easy by this method. By the former methods, where the cupola was dissected whilst the sac was *in situ*, the work had to be done in the dark. The cutting with scissors high up under the internal ligament was difficult; and we could never be certain whether the entire sac with its frequent recesses was removed, or whether portions of the mucous membrane were left behind. That in such an instance the suppuration does not entirely cease, is well known. Still more unpleasant was the profuse hemorrhage, which nearly invariably took place during this part of the operation, and with which every operator is familiar. This abundant hemorrhage was the

dreaded feature of the operation. Clamps can not be used there, and digital compression in the angle of the nose was the only means at our command to control it to a certain extent. It delayed the progress of the work enormously, so that the small operation sometimes occupied an hour. By severing the lower end first, and drawing the sac out of its cavity, the field is always open to view. The cupola can be removed completely. And on account of the stretching and because the cutting can be done close to the walls of the sac, the hemorrhage is reduced to a minimum. I have not been impeded by a single one during over thirty operations done in this manner. Therefore this step can be finished in a very brief time, and the duration of the entire operative procedure is reduced to one half or even one third.

Finally the nasal duct is curetted as far down as possible. The galvano-caustic destruction of the canaliculi I have never found necessary.

Three or four stitches will close the wound. That the cavity should be carefully cleansed and all hemorrhage checked before closing, is hardly necessary to mention. In order to obtain union by first intention, it is necessary to bring the soft tissues in close contact with the bone and to prevent accumulation of secretion between them. This is done by packing tightly. I proceed by placing a small pellet of compressed cotton into the depression and, while holding it firmly, add others until the entire cavity is filled. Then a compressive bandage is applied.

Healing by first intention is expected and is the rule. If there are no untoward symptoms, the dressing is left *in situ* until the fifth or sixth day, when the stitches are removed.

By this method the extirpation of the lachrymal sac has lost much of its unpleasantness. The time for its execution is proportional to the length of my description, as compared with the one of Meller of the Vienna Clinic. The principle is an old one in surgery: an abdominal surgeon will not sever adhesions or vessels of a tumor inside of the abdominal cavity in the dark, but will first pull it out.

I wish to add that I have used local anæsthesia in a number of instances, but prefer general anæsthesia.

(The drawings are made from the cadaver.)

A CASE OF RETROBULBAR PNEUMOCOCCIC ABSCESS OF THE RIGHT ORBIT

By HOWARD V. DUTROW, M.D., Surgeon, Eye, Ear, Nose, and Throat Department, Ancon Hospital, Ancon, Canal Zone.

History.—M. T., Spaniard, age 14, errand boy, four years on the Isthmus, residence Las Cascadas, entered hospital September 20, 1911. Temporary diagnosis slip sent in with patient showed under head of remarks: "Infected right eye—Got bitten by a mosquito about a week ago." Had an attack of lobar pneumonia six months ago. Eight days prior to admission, right eye became painful. One day later there was some swelling of lids and conjunctiva, which grew more marked until the mass was about the size of a hen's egg.

Examination.—Patient was poorly nourished, anæmic, mental condition dull, marked enlargement of spleen, its lower border being palpable about an inch below the umbilicus, respiration normal, pulse slightly accelerated, tongue coated, but the patient had a ravenous appetite on admission and called for something to eat as soon as he was admitted to the ward.

The lids of the right eye were markedly œdematous and red, with chemotic conjunctiva protruding in the palpebral fissure, the cornea being completely hidden from view. There was marked exophthalmos with proptosis and divergence of the bulb, the optic axis being downward and outward, causing diplopia with monocular vision of $\frac{20}{70}$. Ophthalmoscopic examination of the fundus was negative except a very faint cloudiness of the vitreous. The optic disk and retinal circulation were normal. On the day following admission, the temperature rose to 104½ degrees at 8.00 P.M., when I decided to operate the next day. The next morning the swelling of the lids and chemosis of the conjunctiva were still marked, and the patient was restless and suffering from great pain in the right orbit. There was great limitation of movements of the eyeball. The

iris reacted to light, but the pupil was slightly dilated. Leucocyte count was 12,500.

No areas of fluctuation could be made out on palpation.

Diagnosis.—This is not always easy, as the condition may simulate a number of orbital and intracranial lesions, viz: acute suppurative periostitis, thrombosis of the cavernous sinus, thrombosis of the ophthalmic vein, tenonitis, anterior ethmoiditis, panophthalmitis, new growths of the orbit and sheath of the optic nerve, both benign and malignant. In acute suppurative periostitis the area of involvement would be more localized and could probably be determined by digital examination; thrombosis of the cavernous sinus would in most cases show some interference with the intraocular circulation together with choked disk and incipient meningitis (although the ocular symptoms were absent in a recent case of thrombosis in the cavernous sinus diagnosed clinically and afterwards came to autopsy, which I shall report later—the fundi in this case were normal).

Thrombo-phlebitis could be ruled out on practically the same grounds. In tenonitis the movements of the globe are not inhibited to such a great extent and the swelling of the lids is not so marked. An examination of the nose and the history would tend to rule out anterior ethmoiditis. In panophthalmitis the globe would be involved.

In neoplasms, the process would be slow and not accompanied by a sharp rise in temperature. Retrobulbar optic neuritis and glioma of the optic nerve would show well-defined intraocular lesions and loss of vision.

Bacteriological Examination.—The aspirated pus was sent to the Laboratory and was reported by Dr. S. T. Darling, Chief of Laboratory, as containing pneumococci in large numbers.

I have not been able to find anywhere in the literature a case of orbital phlegmon caused by pneumococcus. The most common organisms are the staphylococcus pyogenes and the streptococcus. It is very often found following an attack of facial erysipelas and as a metastatic process following pyæmia or a focus of pus in some remote part of the body.

Würdeman reports a case as having been due to suppurative inguinal adenitis. Boucher states that anthrax bacillus

may be a cause. Losser reported a case in which he found bacillus coli communis.

In my case the explanation of the presence of the pneumococcus is rather simple in view of the recent attack of pneumonia. Owing to the lowered resistance of the patient, due to repeated attacks of malaria, his pneumonia remained more or less unresolved and the metastasis took place from the lungs through the general circulation.

Operation and Treatment.—An aspirating needle was inserted through the upper lid and to the nasal side of the vertical meridian of the orbit deep into its apex and about 5*cc* of pus was withdrawn. An incision along the path of the needle was made with a cataract knife, cutting in the long axis of the orbit to avoid cross-sectioning the muscles, blood-vessels, and nerves. The abscess cavity was cleaned out as thoroughly as possible and packed with a strip of iodoform gauze. The conjunctiva was freely scarified to facilitate the subsidence of the chemosis.

The subsequent treatment was daily dressings, together with tonics and a nutritious diet. The day following the evacuation of the pus, the temperature dropped to 97 degrees in the morning but rose again in the evening to 100½ degrees. He had daily P.M. remission for five days, when it reached normal and remained so until he was discharged from the hospital.

Complications.—With such a virulent organism as the pneumococcus as a causative factor of an abscess in such close proximity to the sinuses of the skull, especially the cavernous sinus and the meninges of the brain, the danger of extension by way of the lymphatics and the optic-nerve sheath and the veins is very great. Any or all of these structures may become involved if the condition is not early recognized and prompt measures taken to evacuate the pus; even then a meningitis is likely to supervene and result in a fatal termination.

Perforation of the globe, with panophthalmitis, may result; permanent injury to the optic nerve from pressure; cerebral abscess; erosion of the inner plate of the orbit, establishing a direct communication with the ethmoid cells, with the liberation of the pus through the nose.

Course.—The clinical picture was not unlike that of localized pus elsewhere in the body and due to the more common organisms. All of the ocular symptoms subsided and vision improved from $\frac{20}{70}$ to $\frac{20}{40}$, which could have been brought up to normal by the correction of a low grade of hyperopia.

AN UNUSUAL CASE OF EPIBULBAR SARCOMA.

By F. H. VERHOEFF, A.M., M.D., Boston.

(From the Massachusetts Charitable Eye and Ear Infirmary.)

(*With two illustrations on Text-Plate III.*)

THE following case shows the manner of growth, the large size, and the ultimate malignancy that may be attained by an epibulbar sarcoma if allowed to run its course without operative interference. It also affords a remarkable demonstration of the fact that absence of any tendency to invade the eye is no indication of a lack of general malignancy on the part of such tumors.

Thomas D., aged 47 years, was admitted to the Massachusetts Charitable Eye and Ear Infirmary June 6, 1907. Ten years previously the patient had noticed a small red spot on "the white" of the right eye on the outer side. This had gradually increased in size until it formed a tumor which three years ago covered the pupil and two years ago completely obstructed the vision. During the past six months it had grown with especial rapidity. The tumor had never been removed, owing, the patient said, to the advice of his physician eight years ago.

Examination.—The left eye is normal. The right eye cannot be seen, but protruding from between the lids is a large soft nodular tumor about the size of a base-ball. This has pushed up the upper lid and distended it to about six times its normal size. The tumor is freely movable, and is evidently not attached to bone. Its free surface is ulcerated and bleeds readily.

The preauricular, submaxillary, and one of the superior cervical lymph glands are much enlarged. No nodules can be felt in the abdomen.

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[1] For the privilege of reporting the clinical features of this case the writer is indebted to Dr. F. E. Cheney.

ILLUSTRATING DR. VERHOEFF'S ARTICLE ON "AN UNUSUAL CASE OF EPIBULBAR SARCOMA."

FIG. 1.—Epibulbar Melanotic Sarcoma. The eye was drawn out of the orbit and is enclosed in the lower-inner part of the tumor.

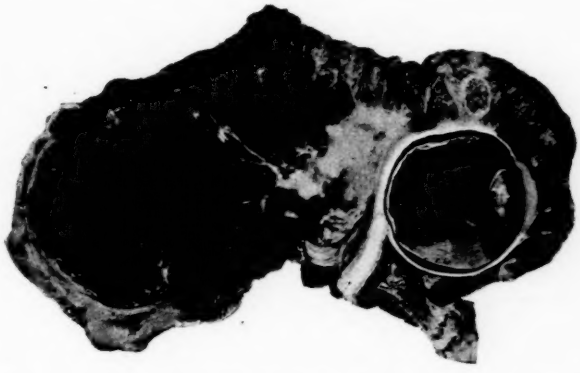

FIG. 2.—Tumor and globe bisected. The globe had been drawn entirely out of the orbit by the growth of the tumor (Actual size.)

June 18th, the main tumor was removed by Dr. Cheney, and the affected glands by Dr. Lincoln Davis. The cervical gland was removed intact, but the removal of the others was incomplete owing to the surrounding tissues being involved. After removal of the main tumor the eyeball was not to be seen, its position being indicated only by the optic nerve which projected from the specimen. It was evident that the eyeball had been drawn entirely out of the orbit by the tumor which had finally almost completely enclosed it. The tumor did not extend into the orbit or involve the bone. Healing was uneventful.

From June 24th to July 1st, and again from July 9th to July 14th, increasing doses of Coley's toxins were daily injected near the orbit, a dose of .5*cc* being reached. There was no constitutional reaction produced. July 19, 1907, the patient was discharged with all the wounds well healed.

From a friend of the patient it has since been ascertained that there was no recurrence about the orbit, but that a recurrence did take place at the site of the affected glands three months after the patient left the hospital, and that in May, 1908, the patient died, no doubt from internal metastases.

Pathological Examination.

The specimen consists of a large tumor mass ovoid in shape, weighing 164*gms* and measuring 8.6*cm* × 7.3*cm* × 4.1*cm*. Its surface is bosselated, dark brown in color, and shows numerous dirty yellow areas. The distended upper lid is adherent to the whole upper surface of the tumor. Posteriorly the specimen shows a depressed area in which can be recognized the optic nerve and extraocular muscles. On making an oblique section through the middle of the mass, the globe is found occupying the inner-lower part of the tumor. The cut surface of the growth is almost black, and shows the markings of smaller and larger lobules produced by fibrous septa extending from the globe.

The globe measures 23*mm* in its horizontal, and 25*mm* in its antero-posterior diameter. The cornea is entirely overgrown by the growth, which is attached to the whole anterior aspect of the eye and extends to the equator above and to within 1*cm* of the optic nerve below. The cornea is thickened to 1.5*mm* and sends small septa into the tumor. It presents its normal translucency after formalin fixation. The anterior chamber is 2.5*mm* deep and is free from coagulum. The filtration angle is open all around. The pupil is free, and the lens, *in situ*, is clear. The vitreous humor is normal. The optic disk is slightly swollen.

The tumor has nowhere invaded the interior of the eye, but at the upper-outer quadrant, at and behind the limbus for a distance of 4*mm*, it has replaced the sclera for a considerable depth.

The involved lymph glands are soft and, on section, intensely black. The cervical gland, removed intact, measures 3.5*cm* × 2.2*cm*.

Histological Examination.—The main tumor mass with the globe incorporated was fixed in formalin. A small piece of the tumor as well as the lymph glands were fixed in Zenker's fluid. Embedding in celloidin. Staining in hematoxylin and eosin and in a variety of other stains.

Microscopic examination of the epibulbar tumor shows it to be composed chiefly of large spindle cells, with areas of large round and irregular cells. The round cells are especially abundant where the tumor takes on an infiltrating character. The tumor is markedly pigmented, the pigment being most abundant in round cells (free pigment cells of Fuchs). Occasionally a typical chromatophore with branching processes is seen. As is usually the case, there are comparatively large areas almost free from pigment as well as others in which almost all the cells are pigmented. The pigment in the tumor cells readily bleaches by the method of Alfieri. In the stroma cells, however, pigment is occasionally seen which fails to bleach and is evidently hematogenous. Mitotic figures are extremely numerous throughout the growth.

The tumor is well supplied with thin-walled blood-vessels which are often closely invested by tumor cells, but a well marked perivascular structure is nowhere produced. Near and along the surface there are numerous hemorrhages and areas of necrosis. The surface is covered with stratified squamous epithelium which in places sends interpapillary downgrowths deep into the tumor. There is no capsule of connective tissue. The stroma is derived chiefly from the cornea and sclera, and in general is not abundant. In many places the stroma is infiltrated with tumor cells. The stroma as well as the parenchyma in places is also infiltrated with chronic inflammatory cells. Mallory's connective-tissue stain shows a considerable amount of fibrillar connective-tissue between the tumor cells, but this was probably not produced by the cells themselves but was an extension from the stroma accompanying some of the vessels.

Microscopic examination of the globe shows that the corneal epithelium and Bowman's membrane have been entirely replaced by a layer of vascularized fibrous tissue which here forms the base of the tumor. It has not been invaded by the tumor except at the limbus above. Here

the cornea and sclera have been replaced by the tumor to four-fifths of their depth. Neither the cornea nor sclera are infiltrated with tumor cells, but there is extension along some of the vessels which reaches almost to the canal of Schlemm. The interior of the eye is normal except that the ciliary body shows some slight perivascular infiltration with chronic inflammatory cells. The optic nerve was not sectioned.

Microscopically the cervical lymph gland is found to be almost entirely replaced by tumor cells. Only at the periphery is there a small portion of comparatively normal lymphoid tissue remaining. The character of the metastatic growth is similar to that of the primary, except that the cells show a marked tendency to assume a perviascular arrangement.

Diagnosis.—Melanotic epibulbar spindle-cell sarcoma. Metastatic involvement of lymph glands.

Remarks

Histologically the tumor did not differ in structure from a melanotic spindle-cell sarcoma of the choroid, and its origin was no doubt similar—that is, from chromatophores of the corneal limbus. The duration of the case, eleven years, was apparently longer than the average duration of fatal cases of chorioidal sarcomata, but it must be remembered that the latter are usually not observed until they are of considerable size. In 1903, after an analysis of most of the previously reported cases, R. G. Loring and the writer[1] arrived at the conclusion that the view then prevailing as to the relative benignancy of epibulbar sarcomata was erroneous, and that they were, in fact, so highly malignant that enucleation should be resorted to as soon as the diagnosis was certain.[2] The correctness of this conclusion seems to be exemplified by the present case. As a visual demonstration to patients of the urgency of early operation, the accompanying illustrations should prove most useful.

In view of the large size of this tumor, which is one of the

[1] F. H. Verhoeff and R. G. Loring: "A Case of Primary Epibulbar Sarcoma," etc. Arch. of Ophth., vol. xxxii., No. 2, 1903.

[2] This conclusion does not apply, of course, to very minute black spots in the conjunctiva, because here the histological diagnosis cannot be made with certainty. These spots no doubt may safely be removed by scissors or knife and actual cautery.

largest, if not the largest, of its kind reported, it forms a striking illustration of the fact that epibulbar sarcomata have almost no tendency to invade the globe. In the literature there are only about five cases, including one examined by the writer, in which it is highly probable that an epibulbar sarcoma invaded the interior of the eye, and even in these the possibility of an intraocular origin of the growths cannot be absolutely excluded.

ADDITIONAL NOTES ON A PATIENT WITH HIGH ASTIGMATISM.[1]

By Dr. B. L. MILLIKIN, Cleveland, Ohio.

ON two occasions I have given some notes taken on an unusual case of astigmatism before the American Ophthalmological Society, these being published in the *Transactions* of that organization. I think, however, that it is so interesting that a brief résumé of the case will not be without some interest to this Society. I shall be glad to make the notes as brief as possible in order not to take up too much of your time.

On August 26, 1891, E. A. S., aged 39, came to me for examination.

The patient before me was a well developed, medium-sized man, somewhat light in weight, but in every respect an active, intelligent, and wide-awake man. He gave me the following history: At 18 years of age he had had an attack of rheumatism, since which time he had complained of trouble with his eyes, and for the past seven years had gradual failure of vision until at the time of seeing him ordinary newspaper print was read with difficulty and there was also difficulty in recognizing people at a distance. He had been subject to frequent headaches, all his life, in the frontal and temporal regions. He had worn minus cylinder-glasses for two years, a very high degree of myopic cylinder in the right eye. With his glasses: O. D. V. $=\frac{6}{24}$(?), O. S. V. $=\frac{6}{15}$(?). Without his glasses: O. D. V. $=\frac{3}{60}$, O. S. V. $=\frac{4}{60}$. There was very little or no muscular insufficiency. The central portions of the cornea were clear while the margins had quite a marked opaque ring, somewhat after the manner of an arcus senilis, the central clear portion being nearly square. By the direct method with the ophthalmoscope

[1] Read before the Eye, Ear, Nose, and Throat Section, Cleveland Academy of Medicine, Nov. 24, 1911.

no details could be made out in the fundus. The ophthalmoscope showed, however, a high, mixed astigmatism. By the indirect method, the disk was shown very much elongated vertically, the veins of good size, and the fundus apparently normal.

In order to test him carefully, atropin was used for four days to put at rest fully the accommodation. On September 11th he was tested under atropine and the following results obtained. In testing him various methods were tried, such as the clock-face astigmatic lines, stenopaic slit, and finally the ophthalmoscope. Neither the stenopaic slit nor the lines nor the use of glasses placed before the eyes brought any satisfactory results. Finally with the ophthalmoscope the following result was worked out:

O. D. $-$ 10 D. Cy. Ax. 90° $\frown$ $+$ 7 D. Cy. Ax. 180°; V. $= \frac{6}{9}$
O. S. $-$ 6 D. Cy. Ax. 100° $\frown$ $+$ 4 D. Cy. Ax. 10°; V. $= \frac{6}{9}$.

With these in place the ophthalmoscopic correction seemed good. As tested with the stenopaic slit, the best vision that could be secured was: R. E. $\frac{6}{24}$; L. E. $\frac{6}{18}$. Therefore, the correction as worked out with the ophthalmoscope was prescribed.

One practical point which was followed in the prescription of the glasses was to make them round, so that any little variation in the axes of the glasses could be very readily corrected, and this has been found an extremely important point. I am sure you can appreciate how necessary exact location of the axes would be in such a condition.

On the 24th of November, 1891, the patient reported he had been able to do any ordinary amount of reading without discomfort, and was practically well able to read ordinary print.

Examination on the 12th of July, 1893: with the two eyes his vision was $\frac{6}{6}-$, being $\frac{6}{9}$ in the right and $\frac{6}{6}$(?) in the left. Occasion was taken at that time to examine him carefully with the ophthalmometer, which showed some remarkable conditions, but was entirely unavailable as to any refraction accuracy in its results. The edge of the circle instead of being round showed on the cornea as elliptical in shape, one side bulging far out and standing at an angle of 100°. The images of the squares and steps were greatly distorted in the horizontal position, being much elongated in that direction, while on making a turn to 90° the squares completely passed one another by more than the entire width of the square, indicating considerably more than double the number of dioptres which the ophthalmometer meas-

ures. The steps instead of being square also became roundish in appearance. In the left eye the white circle became almost exactly egg-shaped, the large end of the egg being down, and its long axis at the same angle as the astigmatism, namely about 100°. In turning the arm 90° the steps overlapped, about half-way beyond the square. With his glasses he had the following accommodation: R. E. 1 D. 7″ to 20″. L. E. 1 D. 6″ to 25″.

This patient was seen again on the 7th of December, 1896. He stated that for six months he had had a little difficulty with his glasses, both for near and far. The vision in each eye, at this time, was $\frac{6}{18}$. Testing him up again the following result was obtained:

O. D. − 13. D. Cy. Ax. 95° to 100° ⌒ + 7 D. Cy. Ax. 5° to 10°; V. = $\frac{6}{12}$(?).
O. S. − 8.50 D. Cy. Ax. 100° ⌒ + 5 + D. Cy. Ax. 10°; V. = $\frac{6}{6}$.

These glasses were ordered.

On December 14th, with his new glasses his vision equalled $\frac{6}{9}$ in the right and $\frac{6}{6}$ in the left. It was found at this time there was beginning presbyopia, so that it required + 2 D's added to his own glasses to give him his best reading point at 14″. These were ordered in a slip-over half frame for use for close work. The appearance of the eye-grounds at this time was excellent with no changes to be noticed, nor were there any changes in the external appearance distinguishable. With these glasses he continued to do steady work, book-keeping.

He was seen again on the 3d of March, 1902, when he gave the history that for two years he had had some little failure of vision, the right eye worse, but no pain. Again it was found that the sharpness of his vision had diminished somewhat in each eye. On testing him out, the following glasses were found the most advantageous.

O. D. − 16.50 D. Cy. Ax. 100° ⌒ + 10 D. Cy. Ax. 10°; V. = $\frac{6}{9}$ + 2.
O. S. − 8.50 D. Cy. Ax. 100° ⌒ + 6 D. Cy. Ax. 10°; V. = $\frac{6}{6}$ − 2.

These were ordered for constant use and 2 D's continued for close work. In the meantime he had gone to an optician who had given him + 4 D. spherical to be added to each eye for close work, which gave him, of course, no comfort. These glasses he wore with entire comfort until Sept. 19, 1910, when I again saw Mr. S., who told me that until the year before he got on very well, then he began to have

difficulty in close work, which had gradually increased in the right eye, the sight becoming more dim for both distance and close work. He had no pain at any time, but had some stomach trouble for a year or more, indigestion, etc. He had been doing close work on books steadily ever since his last change of glasses.

In testing him I found he could not read ordinary print with his right eye. The distance vision of the right was $\frac{6}{18}$ and the left was $\frac{6}{9}$ with his glasses.

The ophthalmoscope showed the eye-grounds in good condition, both eyes. The pupil of the right eye was quite oval vertically with the glasses. The cornea of each eye showed a marked, apparent, arcus senilis, quite irregular in outline, but the condition present was practically the same as was present at the time first seen, only somewhat more exaggerated. Testing him again the following result was obtained:

O. D. $-$ 16.50 D. Cy. Ax. 100° ⊂ $+$ 12.50 D. Cy. Ax. 10°; V. $= \frac{6}{9}$.
O. S. $-$ 8.50 D. Cy. Ax. 100° ⊂ $+$ 8.50 D. Cy. Ax. 10°; V. $= \frac{6}{9} +$.

These glasses were prescribed and in addition $+$ 2.50 D's were given for slip-over glasses for close work.

Mr. S. has used these glasses steadily since then, and has recently informed me that he is again going on with entire comfort, doing book-keeping, night reading, using his eyes eight to twelve hours a day without trouble.

It will thus be seen that this patient has, at the present time, twenty-nine dioptres of mixed astigmatism in his right eye and seventeen dioptres of mixed astigmatism in his left eye, and is yet able to do a full day's work requiring the constant use of his eyes with entire comfort. The case is so remarkable, away beyond anything I have ever seen in the way of astigmatism, that I am sure it cannot but interest any one who is concerned with refraction trouble.

This man has now been under my observation for just twenty years, and during that time his astigmatism has increased from 17 D's in the right eye and 10 D's in the left eye to the present amount of 29 D's in the right eye and 17 in the left. In addition, his presbyopia has come on at about the usual age, and has increased but slightly since first beginning to wear plus glasses for close work. During these

twenty years there have been four refraction corrections at periods as follows—1891, 1896, 1902, and 1910. Each correction has brought his vision in the right eye up to $\frac{6}{9}$ at least, and in the left eye up to $\frac{6}{6}$ nearly. During these twenty years also, Mr. S. has led a very busy life requiring very prolonged and very close work with his eyes and seemingly has suffered no disturbance. So far as I have been able to make out, his eye-grounds have continued to be in good condition, with no pathological changes. During the entire period of the change of glasses I have continued the round shape of the glasses which he has steadily worn and with great satisfaction. This has enabled us at any time to correct any little disturbance in the axes of the glasses, as you can appreciate any little change in the axes would make a vast difference in the sharpness of his vision and in his comfort.

EXCEPTIONAL CAUSES OF FAILURE IN THE OPERATIVE TREATMENT OF STRABISMUS.

By Professor ALFRED BIELSCHOWSKY, First Assistant in the University Eye Clinic in Leipsic.

Translated from the *Archiv f. Augenheilkunde* (German Edition of these Archives), Vol. LXIX., 1911, by Dr. Selina Bloom, New York.

IT is exclusively the failures of operative treatment in strabismus which are to be the subject of the following discussion. The results of this therapy are grouped as complete success, partial success, and failure. The success of operative procedure is complete, if the result is lasting, effortless binocular vision. This occurs in but a small percentage of the cases and is possible only when the strabismus is due to an anomaly of position mainly, unaccompanied by irreparable amblyopia of one eye or a congenital defect of the fusion faculty. In the majority of the cases, we must be satisfied with the partial success of a cosmetic effect. The possibility and means of achieving full success even in a proportion of these cases, I shall discuss fully in the consideration of this subject in the *Graefe-Saemisch Handbook*. Here we are considering only the failures.

Operative therapeutics in strabismus may be considered a failure: First, if the existing anomaly is not removed; second, if the removal calls forth other, principally subjective, disturbances. If the operative failure is due to wrong indication or defective technique, the physician of course is to blame. But there are cases which baffle us in spite of the greatest care and experience, as to indication, and the greatest skill as to technique.

The fundamental rules in operation according to our present knowledge are: First, that it is indicated only where a change

in the mechanical conditions supplies the only means for the cure. Second, that the retention of undisturbed mobility of the eyes should be an aim in all procedures.

Mistakes as to rule No. 1 are most frequent in convergent strabismus of hyperopic children. The hypermetropia is not discovered or not sufficiently corrected for a long enough period or else we give in to the pressure brought to bear by parents who want the strabismus cured without glasses. These cases result later in divergence. The same error is made by a too early correction of paretic strabismus, for the paralysis, after remaining stationary for months, may disappear spontaneously or through general treatment. Mistakes as to this first rule are also occasionally made in cases of pure insufficiency of convergence, where there is a relative divergence near-by but no absolute divergence for distance. As this is a disturbance of innervation purely, operative interference would produce binocular fixation up to a certain middle distance, but at the price of an abnormal position of the eyes for greater distance, so that the damage not only counteracts but outweighs the benefit.

Errors against the second rule are committed, when a tenotomy is done in cases in which an advancement is really indicated. If, in a paralysis or post-operative insufficiency of a muscle, tenotomy of its opponent is made, there will result at best a correction of the anomaly for the primary visual direction only. In spite of this, the result is a failure, because we have weakened the mobility of the antagonist without materially strengthening the insufficient muscle. The patients are then able to see single in one direction only, version in one direction producing crossed images, in the other homonymous images. And as the distance of the images varies with every change in the direction of vision, localization is greatly disturbed. Simple tenotomy is altogether too crude a procedure and should be replaced by one in which the degree can be regulated through resuturing, even in those cases in which an advancement of the antagonist is not absolutely indicated. These facts have been repeatedly discussed in the literature, so I shall take up the main subject of these considerations, namely, those failures in operative therapy which are due neither to ignorance, carelessness,

inattention, nor faulty technique, but depend upon individual peculiarities, difficult or impossible to foresee.

Only exceptionally, do mechanical hindrances from anatomic abnormalities, not discoverable beforehand, prevent success in properly operated cases. The following example is the only failure in over three thousand strabismus operations performed in the Leipzig University Eye Hospital.

I. A-five-year-old boy with moderate hyperopia and $\frac{3}{4}$ vision in each eye had alternate divergent strabismus of 30°; adduction was somewhat deficient in both, and abduction hardly increased. After advancement of both interni combined with tenotomy of both externi, there still remained a divergence of 20°. Three years later, advancement of both interni was repeated, both eyes being kept bandaged eight days. Immediate effect: 12° divergence increasing to 26° in the next month. As adduction was still deficient, the interni were again advanced and shortened as much as possible. At this time, the muscles were dissected as free as possible, and beside the ordinary sutures, auxiliary doubly-armed needles were passed through the body of the muscle and fastened beyond the vertical meridian both above and below. The stitches all held and the immediate effect was all that could be desired, but divergence soon developed again and increased to 30° within three months. It would seem, in such cases, that the divergence is due to a congenital anatomical anomaly, perhaps elastic bands which give way to the stronger action of the advanced muscles for a time, but which later overcome their resistance. We searched in vain, however, for such a condition during operation. We were the more inclined to think of a congenital cause in this case, because a younger brother of the patient was idiotic and had convergent strabismus and congenital cataract. A similar case described by A. Graefe[1] seems to require a different interpretation. The extreme divergent strabismus had followed an oculo-motor paralysis acquired twelve years previously when the patient was 23. Up to that time he had had normal vision. The divergence was moderate after the paralysis was cured, but increased gradually. The abduction of the strabotic eye was only *2mm* less than that of the other eye. Tenotomy of both externi combined with advancement of the left internus had but slight effect, and even this little disappeared entirely after six days. Repeated tenotomy of

[1] A. Graefe: "Motilitätsstörungen," etc., in *Handb. d. ges. Augenheilk.*, von Graefe-Saemisch, ii. Aufl., S. 182, 1898.

the externi with loosening of all connecting fascia was ineffectual. In this case it is not impossible that a repetition of the advancement with resection of a portion of the internus tendon might have had a better effect than the repeated tenotomy, for the insignificant effect of tenotomy in many cases of divergence is well-known, as is also the fact of an unexpectedly great effect of tenotomy in convergent cases. In these latter cases, we must infer that convergence is maintained through abnormal tension of one or both interni, whereas divergence is an anomaly of the position of rest, not connected in any way with increased activity of any muscle. Much more frequently an anomaly of the nervous mechanism of the oculo-motor apparatus is the cause of lack of success in strabismus therapy and, more than any other, the so-called lack of fusion power. This faculty in the interest of binocular vision covers or keeps latent those smaller defects of position present in the eyes of most people. This lack of fusion power may depend upon a congenital or an acquired organic defect of the central organ, and becomes then, on the one hand, the main cause of the strabismus and also the main hindrance to its cure. In the best case one succeeds in getting a cosmetic effect, and then if the pictures of the strabotic eye remain suppressed both physician and patient may be satisfied. Too often diplopia follows, which becomes so persistent that the patient asks for the re-establishment of his strabismus. As long as this last was present, no double images existed on account of their great separation in space and because the attention is fixed in one direction only. If after operation every object stimulates retinal elements of nearly equal potency, both images may assert themselves more easily. If the fusion tendency had been deficient before, only because of the inequality of the two retinal images, it may now become active and stimulate the necessary innervation for the disappearance of the remaining strabismus. This happens in some cases within a few days after operation, quite spontaneously; or else later through the intervention of prisms or stereoscopic or haploscopic exercises. In some patients, however, all effort to obtain fusion remains ineffective. The double images touch each other or partially cover each other, but there is no merging. If one attempts to overcome this with prisms, the images seem even to elude one another. In the beginning homonymous, now they become crossed by the weakest adducting prism or move above one another; the patient may for a moment see them in the same direction, but either one behind the other or just partially displaced over one another.

II. 1905. Richard G., 30 years old, has strabismus divergens alternans of 16°. O. D., E., V=$\frac{6}{6}$; O. S., My., 3, V.=$\frac{6}{6}$. Right eye used for distance; left eye, near. No double images. Artificially produced images consistent with anomaly. Advancement of internus and tenotomy of externus, leaving 2° to 3° convergence for distance. Result: Very annoying paradoxical diplopia. Images homonymous 15°–18° apart. Image of either eye when looking through red glass was lower, showing alternating disassociated vertical strabismus. During the lengthy examination, normal congenital localization is awakened; in spite of unchanged position homonymous images only 2° to 3° apart are noted, which cannot be fused. After lengthy vain attempts to bring about binocular vision, correction of the slight convergence was attempted (upon request of the patient) by simple advancement of the externus with the unexpected result that the entire former 16° of divergence reappeared. Neither double images nor alternating vertical strabismus remained. After a few days the divergence grew considerably less. Though the patient was satisfied we could not be, because in the second operation we had only relieved him of the disagreeable effect of the first, but not of his strabismus, and the main cause was lack of the fusion power. The anomaly of visual localization acquired during the existence of the strabismus, which had protected the patient from double images, would of itself have been no contra-indication for operation, for our experience has shown that such cases, as a rule, either acquire binocular vision after operation, through the use of their normal retinal correspondence, or else are not troubled with double images because, after as before operation, only the image of the fixing eye is taken into account. Why this last did not occur in the case cited and others similar, we cannot say. The post-operative diplopia in our case is the more remarkable because even after the second operation there existed neither binocular vision nor the original degree of the strabismus, in the absence of which the double images had thrust themselves so annoyingly upon the consciousness of the patient before. The complication of the vertical deviation was probably of little importance in this case.

Those cases of lack of fusion power due to an organic defect are easily distinguished from the purely functional. In the first named, the disturbance is of the sensory apparatus, which records impressions of each eye separately but not of the one double eye. The more frequent functional disturb-

ances, also called fusion weakness or lack of fusion power, are not in the sensory apparatus at all, which is normal, but in those connections between the sensory and the motor apparatus which carry out the fusion activity. The result is that when there is any disparation of images of the two eyes, the automatic, normal fusion movements do not occur and the object appears double. Fusion occurs only after the deviation is corrected with prisms. The worst cases of this kind do not possess the least amplitude of the fusion power—that is, the smallest amount of disparation cannot be overcome. All grades of defective fusion power exist, not only in different individuals, but in the same individual at different times, depending upon the physical and psychic conditions.

The functional disturbances of fusion cannot always be recognized with certainty. Often repression of the impression of the strabotic eye is so marked that there is only alternating uniocular vision, or else there exists an acquired visual direction anomaly, corresponding to the strabotic position, which does not permit fusion even when the disparation is corrected by prisms or haploscope, because the normal corresponding retinal parts now have other values according to this anomalous development. From the fact that no fusion is possible, we cannot conclude that this will be so after operation, for I have had cases of strabismus in which anomalous localization had existed many years which acquired binocular vision the next day after operation. Others without anomalous localization, in whom double images were easily produced, were troubled for years with double images because they were unable to overcome the slightest disparation. Again others remain alternating even after operation, unable as before to receive impressions of both eyes at the same time. Thus it is impossible to say beforehand what influence the straightening of the eye will have on the sensory condition; otherwise it would be easy to avoid the failures by not operating.

The functional disturbances of fusion are observed, as a rule, in the latent and periodic strabismus of small degree. The cases present the characteristics of a functional neurosis, accompanied often with hysteria or neurasthenia. The ocular disturbance has a definite beginning after an exhaustive illness or after inflammation of conjunctiva or cornea in

anæmic and neurotic subjects. Sometimes a psychic disturbance marks the beginning or there is only a neuropathic habitus recognizable in the variation and peculiarity of the patient's description of the ocular pain and sensations. If we find in such patients no other anomaly than a latent or a periodically manifest strabismus, we may be inclined to make this answerable for the disproportionate subjective symptoms, and attempt a correction of the "muscular asthenopia" with prism or exercises without result. Then operation is considered indicated and still more unpleasant disappointments occur. I would like to give several unpleasant examples of this.

III. A working-woman, 36 years old, while being treated for a chronic blepharo-conjunctitivitis two years before, began to have diplopia, the picture of complete paralysis of convergence, crossed double images but slightly displaced laterally and vertically, no paralysis of any muscle. After some weeks, disappearance of the diplopia with recurrence after a short time, during which another colleague attempted several operations—advancement of internus of one eye, tenotomy of externus of the other—without the slightest result. After the continued diplopia, patient applied for an invalid pension, on which account she came under my observation. I found a manifest divergence of 1° to 2° in the primary position, which increased to 8° upon directing the eyes downward. It seemed impossible for the patient to converge. It soon became manifest, however, that ordinarily she was incapable of any impulse to near vision, accommodation and pupillary reaction remaining absent, though these are usually present during near vision when only the convergence is paralyzed. If, however, I used a fine object, such as very fine print or the seconds hand of a watch for fixation, instead of my finger, direction of vision, accommodation, and pupillary reaction were all correctly active. A real paralysis of convergence was not present, the fusion apparatus existed, only the fusion tendency was lacking, because of a pathological weakness of the will.

The following are types of cases of failure which seem prognostically favorable beforehand: Considerable latent deviation, undisturbed correspondence of retinæ, but subjective symptoms seemingly due to the innervation effort of fusion.

IV. A lady, 31 years old, suffered for years from a boring

headache above the right eye with periodic divergent strabismus. According to her brother, a physician, she had shown from youth neurotic tendencies which increased after marked emotional shocks. One of our best clinicians made a tenotomy of the externus and an advancement of the internus of the right eye. After this, the headaches disappeared, but diplopia was troublesome. Images in the central and left half of the visual field were crossed, but in the right field were homonymous. Following a careful tenotomy of the left externus there was such marked convergence for all directions that modifying sutures had to be used. Result: Binocular single vision in the central field for distant and near objects, but in the right field homonymous and in the left crossed images, due to insufficiency of version of the right eye. There was, besides, slight hyperphoria, left. Patient consulted me in 1908 on account of double images. Refraction E., vision normal. Convergence of 2° in direct vision remaining stationary upon left version, but increasing upon right version and still more upon lowering the direction of vision. Upon looking up, binocular single vision. With the diplopia there was slight hyperphoria left, and a declination of corresponding meridians toward one another. Images become closer upon convergence up to 30*cm*, after which they become crossed. In the stereoscope some breadth of fusion was noted. Upon request of the patient, on account of the annoyance of double images, for distance I made an advancement of the right externus, the post-operative insufficiency of which had caused the increasing diplopia in the right field. Result: divergence of 8° with return of the headaches, increasing during the day. Vertical deviation and declination remained stationary, tendency to fusion seemed markedly decreased. Three months later advancement of the right internus. Result: good at first, muscles balanced, afterward result entirely lost. In the stereoscope, fusion of images could always be effected, but the breadth of fusion was reduced to a minimum. Prism glasses, correcting the vertical deviation entirely and the horizontal partially, brought no relief, neither did stereoscopic exercises. After remaining stationary a number of months, the headache and diplopia reappeared. No relief from covering one eye. All kinds of nervous symptoms, fear, unrest, sleeplessness. I was forced by her importunities to make another attempt to cure the diplopia, and decided upon tenotomy of the right externus which I attached back and above the old insertion, in order to influence also the upward deviation of the right visual line. After this the 10° divergence for distance

became convergence of 1° to 2°. The vertical deviation, which had increased from 3° to 6° upon right version, was reduced to a minimum. The patient had comfortable binocular vision for a time, and tolerable breadth of fusion, remaining free from headache and diplopia. Seven months later diplopia for distance, and later for near vision with recurrence of headaches. After taking phenacetine for the latter, the diplopia disappeared or was not so noticeable. After two years when I saw the patient again, she was having constant headache and double images. Both disappeared under phenacetine for several hours. Convergence of 3° in the primary position disappearing upon looking up or to the left, increasing to 10° upon looking to the right. We have here a neurotic individual whose headaches in the first place seemed due to a periodically manifest divergence. Operative correction produced temporary disappearance of headaches, but caused annoying diplopia. Different operative measures bring about an improvement for several months, then all complaints reappear and are not cured by any ocular therapy. Headaches remain even when one eye is shut off from use. Medicament for the headache cures the diplopia, a fact of some etiological importance which will be discussed more fully in summing up the next case.

March 12, '09.		V. Lady, 18 years old, with periodic strabismus and headaches.
		V. R. with cyl. + 1.0 ↑ = $\frac{6}{6}$.
		V. L. with cyl. + 4.5 ↗ sph. − 2.0 = $\frac{6}{24}$.
March	13	Divergence (varying to) 10° besides positive (+) vertical divergence[1] (V. − D.) of 4°.
April	3	(I) Advancement rect. int. sin.
"	8	Muscles balance in the primary position.
"	10	For one day diplopia; 7° divergence.
		(II) Ten. rect. ext. sin.
"	14	Muscle balance.
"	19	Diplopia and 3° divergence.
May	13	6° div. 8° (+) V. − D.
"	18	(III) Advancement rect. int. oc. d. with displacement of insertion downward.
"	22	Only 1° (+) V. − D. (latent).
"	24	Diplopia: 5° diverg., 8° (+) V. − D.
"	25	In primary visual direction, 10° div., and 10° (+) V. − D. Upon holding red glass before right eye 12° (+) V. − D. (lat-

[1] Vertical divergence V. − D. is called positive (+) when the right visual line is directed above, left below; contrary condition is called negative (−).

eral deviation 10°). Red glass before left causes in the first instance marked (+) V. − D. which disappears and then becomes (−) V. − D. of 2° (lateral deviation 5°). Upon removing red glass from the left eye, image of this eye becomes 10° higher than the right, although no change in the direction of fixation has taken place.

Patient is so troubled by headaches that she is unable to work.

June 30 (IV) Tenotomy rect. later. dext.
July 7 2° convergence, 5° (+) V. − D. (latent).
" 12 Diplopia: 4° divergence, 9° (+) V. − D.
" 16 (V) Tenotomy of rect. super. dext. with displacement of insertion medially.
" 18 4° divergence, 2° (−) V. − D.
" 28 Prism lenses prescribed, 5° O. D., 3° O. S. base nasal which removes diplopia.
Aug. 8 Return of diplopia, 6° divergence, 2° (−) V. − D., the latter increasing upon right version to (−) 7°.
" 17 (VI) Careful tenotomy with displacement upwards of rect. later. dext.
" 20 Diverg. 15°, V. − D. = 0.
" 27 (VII) Advancement rect. med. dext.
Sept. 1 Diplopia, 6° diverg., 3° (−) V. − D
" 15 7° diverg., 4° (−) V. − D.
Oct. 10 9° diverg., 2° (+) V. − D.
" Red glass before o. d. (+) V. − D. 6°.
Red glass before o. s. (−) V. − D. 5°
" 21 (VIII) Advancement, rect. med. sin. Immediate effect, considerable convergence.
" 27 Muscle balance.
Nov. 3 5° divergence, diplopia.
" 5 (IX) Advancement rect. med. dext.
" 9 Muscle balance.
" 13 5° divergence, diplopia.
Dec. 12 8° divergence, 5° (+) V. − D.
Jan. 4, '10. 10° diverg., 5° (+) V. − D.
" 5 (X) Advancement rect. med. dext. Tenotomy rect. later. dext.
" 5 4° (+) V. − D.
" 12 5° diverg., 5° (+) V. − D.
" 28 7° diverg., 9° (+) V. − D.
Feb. 2 10° Diverg., 10° (+) V. − D.
Red glass before o. s. (+) V. − D. becomes (−) V. − D. up to 3°.
May 24 (XI) Tenotomy rect. infer. sin.

Same evening, 10° divergence, V. − D. = 0 (remaining absent until June 4th).

June 6 — 3° (+) V − D., red glass before o. d. 10° (+) V. − D.
Red glass before o. s. 3° (−) V. − D.
Prism 10° b. u. before o. d., smoked glass before o. s., remove diplopia, and are prescribed. Patient free from symptoms two weeks, then recurrence of diplopia and headache, upon which exclusion of one eye has no effect.

June 20 — (XII) Advancement rect. med. dext.

" 28 — Patient free from complaints. 1° latent convergence. 3° (+) V. − D.

Aug. 12 — No complaint until to-day. Without cause severe pain above o. d.

" — Next day diplopia.

Oct. 7 — 2° divergence, 5° (+) V. − D. 0.5 asperin produces nausea, but causes disappearance of headaches and diplopia for several hours. Antipyrin has the same effect. Prescribed Bengué-balsam rubbed on the forehead at night and absorbent cotton bandage. After this patient remains free from symptoms upon regular use of the balsam. Has binocular single vision, no headaches, and in exhilarated mood. Two and one-half months later complained of diplopia and said headaches only are removed by the balsam application. 6° to 8° of divergence and about the same + V. − D.

Jan. 12, '11. Balsam prevents the headaches at night only, by day patient troubled with headaches and diplopia. 6–7° divergence and (+) V. − D.
Moderate darkening o. s. V. − D. = o.
Marked " o. s. 3° (−) V. − D.
" " o. d. 10° (+) V. − D.
Prisms 4° both eyes, o. d. base down, o. s. base up, give exact binocular vision. Lateral deviation variable but coincides in general with the position of the double images.

If I had not experienced such a course of treatment as this myself, but had only read or heard the history, I should have suppressed a doubtful shake of the head as little as the reader of this report. Is such an accumulation of operations upon

one individual ever justifiable? The right internus tendon alone was advanced five times. After thirteen operations, during two years' treatment, the result is quite doubtful. What is the reason? Of course we became more and more unwilling after each operation to undertake other operative procedures and tried all the known non-operative methods without avail repeatedly for weeks and months. Neither would we, in spite of the urging of the patient and her father, have resorted to repeated operations had there not been an objectively evident muscular anomaly and an uneven functioning of those muscles which are active for the associated movements of the eyes to justify our interference.

The operations were done, some by Professor Sattler, some by myself, and others by Dr. Stimmel with my assistance, and the technique cannot be blamed for the result. In all, the immediate effect was in accordance with our intention, and in the later operations we could observe that in no case had the muscle slipped back later on. For a long time we could not understand why the good operative effect was lost later, and thought at first of unusual anatomical conditions, such as elastic bands influenced at first by the operative measures but later becoming predominant and forcing the eyes back to their original positions (compare Case I). This theory, however, had to be abandoned because the phenomenon of an alternating (disassociated) vertical deviation was shown by the characteristic effect of the darkening of the fixing eye upon the position of the strabotic eye. I have recently reported upon a large number of such observations.[1] The surprising impression which the examiner gets from such a case and the clearing up of totally unintelligible and seemingly contradictory symptoms through the establishment of their regular occurrence in a whole group of cases, can be demonstrated by no better example than this case. The existing strabismus angle could always be exactly noted in our case, because the patient could always easily place the indistinct image of the left eye, even without any artificial differentiation. A few days after the third operation, which

[1] "Ueber einseitige, bezw. nicht assozierte Innervationen der Augenmuskeln." *Arch. f. d. ges. Physiologie*, Bd. 136, S. 658, 1910. (Festschrift für Ewald Hering.) *Arch. f. A.*, lxix.

at first seemed fully to correct the strabismus, the patient had diplopia again; the vertical deviation increased upon placing a red glass before the fixing right eye, and to my astonishment the image of the left eye became lower and sank even below that of the right, if the red glass was placed before it. Upon removal of the red glass, the image of the left eye immediately rose 12°–13° above the right. The images corresponded to the objective change of position of the eyes upon the placing and removal of the red glass. The fixation point (a candle flame in the median line at 5 metres) was not changed during the entire experiment.

For some time, the patient was relieved of symptoms by glasses, smoked, before the left, and an abducting prism before the right. She had binocular vision and no headaches, but always there could be noted the temporary influence of the darkening upon the vertical deviation.

From these conditions we may conclude, that mechanical factors cannot be made answerable for the vertical component of the strabismus. The later observations showed that involuntary disturbances of innervation of the oculo-motor apparatus were the main causes of the subjective and objective symptoms, and of the failure of the operative measures. After the last operation, the patient remained free for three entire weeks, longer than at any time from the beginning of the treatment, and had exact binocular vision without any mechanical help. Then suddenly she had severe headaches, diplopia appearing only the next day, the degree being at first less than formerly. It was impossible, I said to myself, that the good effect of the operation should disappear so suddenly after three weeks. Further if the headaches had been due to an innervation-effort in the interest of fusion, it would not have been present during the long period in which the patient had diplopia and without the least tendency to fusion. It would also have disappeared upon exclusion of one eye from the visual act. The headaches then must have been due to a pathological process which had nothing to do with the ocular disturbance. It was possible that both headaches and diplopia were different symptoms of the same or different pathological processes, or else the general condition must have been so affected by the headaches that there was no longer sufficient

energy for the maintenance of the oculo-motor equilibrium.

I decided then to try several anti-neuralgic remedies, and with surprising results. The patient remained free from complaint for several months, and not only the subjective symptoms but the objective anomalies were corrected to the extent that the patient had comfortable binocular vision.

After several months, the remedies lost their good effect, the diplopia reappeared, and several weeks later the headaches. The only lasting good effect of the therapy which can be noted is that if part of the vertical divergence be corrected by prisms the patient is able to overcome the remainder spontaneously. To imply the diagnosis "hysteria" in a case such as this would be to make no explanation whatever, and I should have been compelled to do this if I had not become familiar with the phenomenon of one-sided eye movements which were quite independent of the will or the fusion force in a large number of cases of alternating (disassociated) upward strabismus, a condition which I found again in this patient. I have explained these one-sided eye movements, in my contribution to the "Festschrift für E. Hering," as a result of an abnormal excitation of the subcortical centres which control the motor apparatus of the single eye. Most commonly it is the double but unequal or one-sided abnormal innervation of the vertical motor apparatus which permits one-sided vertical movements or alternating dissociated vertical strabismus to appear. It is especially remarkable that in all these cases it is the rule to find that the abnormal motor excitation is influenced in an antagonistic way through darkening and illuminating the eye, the motion being upward upon darkening, downward upon illuminating. Further it was noted that these phenomena were held in check as long as the will and fusion force were active, and became evident (when these were absent) in that eye whose position was not fixed by the fixation intention. I have seen the failure of operative procedure in a number of such cases. This is because a strabismus operation can only be of benefit when the strabismus is kept up by mechanical factors or depends upon a disproportion in the function of associated muscles or groups of muscles. In extraordinary cases like the one

cited it may be that the anatomical position of rest is normal and the periodic strabismus is due to one-sided intermittent stimulation of one group of muscles, which of course is not removed by the operative procedure. If, for example, when the right eye is fixing and in the primary position, the left is at times directed on a level, and at other times (as a result of an abnormal one-sided stimulation of the ocular levators) is directed upward, then the effect of tenotomy of the left superior rectus would be the levelling of the two eyes only during the phase of abnormal stimulation of the left levator, whereas at other times the left eye would be lower than the right. If the eye is amblyopic, the effect is important cosmetically only, but if there had been formerly periodically normal binocular vision, this is made difficult by the operative change of the position of rest into one of vertical divergence. In some cases this was observed, in others the successful operative effect was lost again, and the impression received was that the abnormal one-sided stimulation increased in proportion to the increased muscular difficulty. The course of the above case is a striking example of this. No matter what was done to correct the V. — D., the abnormal innervation always allowed the V. — D. to return in the course of time and to the same degree. That it was always the innervation anomaly through which the effect of our operative measures was annulled, was shown by the regular repeatedly controlled influence of darkening one or other eye: darkening the right, the V. — D. reached the highest point, which disappeared or was converted into the opposite V. — D. if the left was darkened. This phenomenon becomes clearly understood through the coincidence of more than eighty similar cases which have been collected by me, the darkening of one eye permitting the abnormal stimulation of the same sided levators to become active. If the fixing right eye is darkened, in order to retain fixation, the patient finds it necessary to exert a compensating voluntary lowering impulse in order to equalize the abnormal impelling forces toward elevation of the other. This voluntary impulse passes (as do all voluntary motor impulses) to both eyes and increases the already existing downward strabismus of the left eye. If the latter is darkened during this downward deviation, abnormal stimulation of the left levators

takes place and not only overcomes its deviation downward but even elevates it above the right.

What the nature of such abnormal stimulation is, nothing is known at present. A neuropathic foundation is not necessary in my experience, for I have found the condition frequently in quite healthy individuals who had no discomfort on account of it. However both general and nervous disturbances may allow symptoms—especially diplopia—to appear in the motor apparatus of patients who were formerly free from complaints. In the above quoted case it was undoubtedly the headache, or rather the cerebral process producing the headache, which was the direct or indirect cause of the ocular manifestation. Analogous disturbances exist in migraine-ophthalmoplegique in which either irritative or paralytic symptoms may be produced by vaso-motor disturbances. As anti-neuralgic remedies gave such surprising results, some such explanation as this had seemed rational at first, but as in the further course diplopia existed at times without headache and headache without diplopia, it is probable that the causative factors of the different conditions were not connected. Even though, in consideration of the occurrence of a large number of such cases, one must suppose the abnormal motor stimulation fundamentally a congenital anomaly or at all events one developed in early childhood, it certainly seems to be exhibited in a different degree of intensity according to the general condition of the individual; in the best case it may become latent, or it may occur periodically, or be in the worst case permanently manifest. In the above case I think there had existed since childhood most probably latent divergence, and, besides, a (formerly also latent) nervous anomaly which predisposed to one-sided stimulation of the vertical motors. Through an unknown exciting factor, the picture described above was produced, headache in conjunction with eye symptoms. These latter were the expression of a weakening of the fusion power on the one hand, and on the other were a direct result of the pathological process on the oculo-motor centres of one side, giving rise to the periodically recurring and increasing stimulation of the vertical motors of the eye.

I have discussed this case at such length, not because the history is unique, but because the important points which we

believe were at the bottom of our operative failure here—namely, fusion weakness and abnormal stimulation conditions in the motor apparatus—cause and have caused disappointments and failures in other cases, of which I shall give several examples.

VI. A trained nurse, 23 years old, sought the clinic on account of poor vision, in 1902. Vision normal, with O. D. cyl. − 2.5, O. S. sph. − 3.

In 1904 some increased myopia, also a divergence of 10° mostly latent. I saw patient first in 1905. Had had a severe perityphlitis for which she had only lately had an operation. Since then permanent alternating strabismus 8° lateral, and 7° vertical deviation. Either the right eye deviated outward and downward, or the left outward and upward. No diplopia.

Sept. 23, 1905. Operation I. Careful advancement of the right lateralis. A little vertical divergence remained. In the first days after the operation, homonymous diplopia, although no convergence can be observed. Diplopia disappears for several weeks, recurs but does not coincide with the very varying strabismus angle. After fourteen days there is again 5° manifest divergence and 7° vertical deviation.

July 12, 1905. Operation II. Tenotomy, rectus sup. sin. Vertical deviation in the next weeks varying, the strabismus mostly latent, no subjective disturbances.

June 3, 1906. Periodic manifest lateral and vertical divergence of 8°. Double images correctly localized; considerable headache therefore.

Operation III. Advancement, rectus med. sin. Binocular bandage five days. For some weeks effortless binocular vision, only 1°–2° latent lateral and vertical deviation remaining.

Two and one-half years later, patient complained of blurring during near vision. Has laryngeal trouble of two years' standing, thought to be tubercular in beginning, later recognized as hysterical-paralysis of vocal cords. Strabismus angle variable, but generally 6° both lateral and vertical.

October 28, 1908. Operation IV. Tenotomy of rect. infer. dext. resulted in an unexpected over-effort; in spite of this the beginning (−) V. − D., was gradually converted into (+) V. − D. of 5° in the second week, but the deviation soon became latent and patient was subjectively improved.

February 15, 1909. Patient suffering again with nagging headaches. The post-operative (+) V. − D. was nearly 10°, the latent divergence 6°.

March 30, 1909. Operation V. Advancement of rect. inf. dext. Result: Vertical divergence reduced to 1°, lateral increased to 7°–8°.

April 13, 1909. Operation VI. Advancement of rectus med. dext. Immediate effect: Considerable convergence. After one week: 2° convergence, 2° (+) V. – D., latter increasing in next months to 9°–10°. Complains of diplopia and headaches.

August 5, 1909. Operation VII. Marked advancement of rect. inf. dext. with insertion of tendon farther to the medial side. The V. – D. disappeared; the former disturbing tendency of the images to incline toward each other was gradually lost; 2°–3° latent divergence remained. Fourteen days later there was sometimes binocular single vision, sometimes crossed images 1°; in the primary position with a colored glass a slight alternating hyperphoria was present, of 2°–3°.

For several months the subjective condition of patient remained good. She had binocular vision, considerable breadth of fusion upon stereoscopic examination, and was little disturbed by headaches. Later headaches and diplopia appeared after near-work. The distance between the images was mostly short and noticeably variable, sometimes corresponding to divergence of 1°–2° or convergence of 1°, without or with a (+) V. – D. up to 4°. At times there was binocular fixation, however, except upon marked lateral version. Headaches remained.

Patient was treated for months with rest, vacations, and iron preparations without result. There was no exaggeration of subjective symptoms; the patient was constantly urging to be allowed to undertake a larger field of activity.

This case shows such a great similarity to the last that no comment is necessary. It is a neurosis which, beside other disturbances, has caused an abnormal innervation of the oculo-motor apparatus, which operative procedure could not remove.

VII. A lady, 25 years of age, had been operated upon a number of times, twelve years before, by a well-known colleague in Lübeck, for strabismus divergens and diplopia. One year later, another operation was performed because, according to the patient, the right eye was higher than the left. The last operation was as unsuccessful as the earlier. The patient suffers from diplopia, which makes all work impossible. She is especially distressed by the ever varying distance of the images. Pain in the eyes during near vision

occurs even upon exclusion of one eye. Prism-glasses and stereoscopic exercises are without avail.

I found slight hyperopia and full vision. Upon direct vision in the distance there is a minute deviation, scarcely 1° divergence and (−) V.−D. to 4° of the right eye, which is also rolled slightly toward the other eye. The vertical deviation varies constantly without change of fixation. Upon fixation with the left, the right becomes restless, moving up and down, which the patient observes also. Fusion of double images with prisms or haploscopic apparatus is incomplete and evanescent. The strabismus is not concomitant, but has the character of the disassociated upward deviation. Whichever eye is darkened deviates upward. On account of the slight and changing character of deviation no operative procedure was considered. Neurological treatment also without result. The failure in this case is due to abnormal stimulation of the vertical motors of right eye. Cause of this abnormal stimulation is unknown.

Finally, I would like to describe a case to illustrate the very great difficulty encountered at times, where in spite of complete justification for operation from the objective examination, and in spite of a most carefully performed operation, the unsucessful outcome is impossible to foresee, because there may be nervous elements in the causation of the strabismus, not recognizable before operation.

VIII. A man, 36 years old, has been suffering with headaches and unsteady vision especially in the street. Has noticed diplopia occasionally after fatigue. Prisms have given relief at times only.

When binocular vision is prevented, there is deviation of the right eye downward (−) V.−D. gradually increasing to 9°. Upon changing visual direction, the (−) V.−D. varies in the sense that the maximum is reached upon looking up to the left, but differences are slight and not constant for the same direction. The double images of a horizontal stripe converge to the right (over-activity of the inward rolling muscles). Flexion of the head to the left shoulder increases the V.−D., flexion to right decreases it, indicating a relative or absolute insufficiency of the musculus obliquus inferior. dext. Both eyes have vision of $\frac{6}{6}$ with + 1.0. As patient had worn prisms before without effect, I made a tenotomy of the rect. sup. sin., and corrected the over-effect [10° (+) V.−D.] immediately by tying the sutures passing through the tendon. Removed sutures after four days, as (+) V.−D. was only 1°–2°. On

sixth day it had increased to 8° and the diplopia was quite annoying. Eight days after the operation 5° (+) V.−D. and 5° convergence. Upon the tenth day, 9° (+) V.−D. and 10° convergence.

The only thing that could be done was to advance the rect. sup. sin., which I did July 20, 1910. Result: slight (−) V.−D. which had disappeared by the 27th. July 29th examination showed scarcely ½° (−) V.−D. and the patient felt very well. August 1, 1910, he reported that upon awakening he noticed diplopia, which disappeared again, but he felt as if his head were being compressed. Upon examination a (−) V.−D. was found which increased to 7°.

August 30, 1910. After a vacation, he reported that he felt decidedly better; noticed, only momentarily upon awakening, diplopia. Examination shows hardly ½° (+) V.−D.

During the next months there was always present a latent (+) V. − D. ½ to 2°.

November 5, 1910. Patient complains of occasional diplopia. Examination shows 1½° (−) V. D., and convergence 4°–5°. Stereoscopic exercises for two weeks caused disappearance of diplopia. Headaches only upon prolonged reading. No convergence present, only a trace of V.−D. ½° positive or negative. The neuropathic character of the ailment is evident in the way the patient, a strong, healthy-looking man, describes them. He speaks now of a feeling of compression, then of a sandy feeling, again of a blind feeling, of a dazed state, as if he had been over-drinking, then again as if the brain were too loose, etc. The course of the treatment also allows the conclusion that the vertical divergence is greatly influenced, if not directly caused, by an abnormal innervation. After an ordinary strabismus operation, it is usual for the tendon to be so well fixed five days after operation, that the suture can be removed without fear of any mentionable change in the position of the eyes. Here it increased from 1°–2° (+) V.−D. to 9° and a convergence appeared which had not been observed before. Still more strange was the appearance of an operative over-effect of 7°, ten days after advancement had produced equilibrium. This over-effect also disappeared and was not noticed in the next five months.

In such cases we are dealing with a varying strength in fusion power, dependent upon the existing physical and psychic condition. To this is added, abnormal stimulation of the oculo-motor apparatus, which is as little understood as other neuroses.

To recapitulate in short our observations and thoughts: Concerning the ætiology of strabismus, we have long taken

into account and distinguished between mechanical and nervous factors in convergent strabismus, but have thought all other forms dependent upon the mechanical, upon anomalies of the position of rest only. According to later experiences such as the foregoing histories illustrate, it is evident that divergence and vertical deviations also depend not so rarely upon abnormal innervation of the muscles. If such cases are treated like anomalies of the position of rest, failure is inevitable.

As to the symptomatology of strabismus, it is noteworthy that the subjective complaints given in latent or (periodic) manifest strabismus can not by any means always be looked upon as symptoms of so-called muscular asthenopia. Not seldom, contrary causative relations exist; the subjective disturbances produced by the unknown anomaly allow the strabismus and diplopia to become evident, because the disturbance in the general condition (reduction of energy) has an untoward influence upon the strength of the fusion apparatus. In such cases, correction of the anomalous position can have no, or only an incomplete, effect upon the subjective complaints.

From these results, the following conclusions for therapy may be made. Warning against too hurried operations can not be too urgent No case of strabismus should be operated after one examination, because frequently re-examinations allow recognition of possible deviations from the typical —the disassociated character of the anomaly, the inconstancy of the angle, and its dependence upon physical and psychic conditions.

In consideration of the fact that generally there are no subjective symptoms in ordinary typical strabismus—either the permanent or periodic—one should search for neuropathic disturbances when subjective symptoms are present.

The smaller the strabismus angle and the more prominent the disproportion between it and the intensity of the subjective complaints, the more conservative we should be with operative procedures. If this can not be avoided, the patient should be informed of the uncertainty of the result and of the possibility of the appearance and continuance of diplopia after operation.

In spite of all precaution and care, occasional failures will

naturally be unavoidable. But their number will become smaller, the more exact our knowledge becomes of the manifold factors in the ætiology of strabismus, through which knowledge the basis for therapy will become more clearly defined.

A CASE OF INCONGRUOUS HOMONYMOUS HEMIANOPSIA.[1]

By Dr. OTTO SCHIRMER.

(With two cuts in the text.)

THE case of homonymous hemianopsia I have the honor to present to the Section is one of unusual interest because of incongruities in the field which developed during the regressive period. It is the more worthy of attention because the incongruities lent such indispensable aid to the exact localization of the lesion in the brain.

The patient, male, 20 years of age, retired at 11 P.M., August 19th, apparently in perfect health. At 4 A.M. he awakened with severe headache and noticed the peculiar disturbance of vision. He could assign no cause for the onset of his illness.

The patient has a rather weak constitution. He has never suffered any severe illness. A careful physical examination revealed no evidences of disease. Wassermann reaction was negative. Blood pressure normal.

The headache persisted with undiminished severity for the whole day. No vertigo or nausea. No vomiting save once after taking castor oil. The following day there was less headache. On the next day it had disappeared. The visual disturbance continued unchanged till August 26th, the day of my first examination.

The eyes appear normal, media clear, disks normal. Vision in right eye $\frac{20}{70}$ with 2 D. cyl. 25° temporally. Left eye had $\frac{20}{20}$ without glasses. The amblyopia of the right eye is in my opinion congenital, although the patient was unaware of its existence. In the first place, the eye trouble present is not likely to produce amblyopia. Further, there is hyperopic astigmatism with oblique axis, whereas

[1] Read before the Ophthalmological Section, N. Y. Acad. Med., November 20, 1911.

the left eye is emmetropic. Lastly, there was no improvement of central vision, while the other symptoms were improving.

The peculiar disturbance of vision complained of by the patient proved to be an absolutely complete, homonymous hemianopsia of the left side. There must, therefore, be a

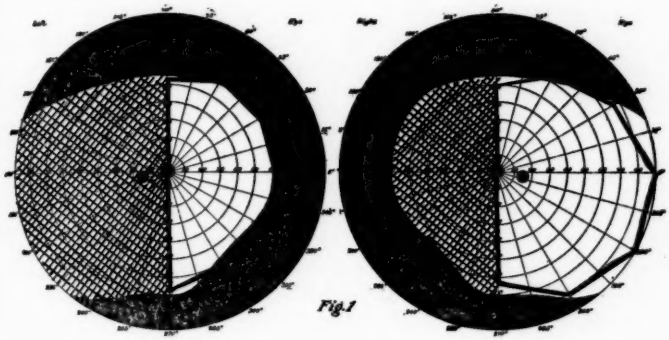

Fig. 1

focus in the optic fibres of the right side, behind the chiasm. The sudden onset and the rapid recession of the symptoms would indicate a lesion in one of the blood-vessels. Embolism is unlikely as the heart is normal. Thrombosis is rather improbable at such an early age. It is most likely, that the symptoms are due to hemorrhage due possibly to a congenital —or not congenital—weakness in the walls of a vessel, or perhaps to an aneurysm of one of the smaller vessels.

The lesion must have been small, as the general symptoms were so very slight. Inasmuch as it produced complete homonymous hemianopsia, the lesion must be situated at a point where the optic fibres are still close together, where a small lesion can inhibit their function—*i. e.*, the optic tract.

There are two more symptoms, which would lead one to localize the lesion in the optic tract.

First, the macula-preservation, what we call in German "Maculaaussparung," was absent. The line of separation passed directly through the point of fixation. It did not deflect into the blind halves around the point of fixation, leaving intact the function of the entire macula.

The "Maculaaussparung," so far as we know, is due to the fact that the macula is represented in both cerebral hemispheres. Destruction of one psycho-optic centre or the central parts of Gratiolet's radiating fibres always leaves the macula intact. In the tract these fibres have not yet crossed; there is therefore no "Maculaaussparung" in tract-hemianopsia.

The other symptom pointing to a lesion in the tract is the presence of hemianopic pupillary reaction. I have never observed a complete absence of reaction from the blind halves, nor can we expect it—except in using very slight illumination —for it is impossible even with optical instruments, to throw the light on only one half of fundus and leave the other half in total shadow. A fraction of the light-rays are always deflected to the normal retina by the physiological irregular refraction. The pupillary reaction will, however, be much less marked than if the normal half of retina is illuminated. To establish the diagnosis of hemianopic pupillary reaction, it is sufficient therefore to put lights of exactly the same power at the same angle to both sides of the patient and to illuminate each eye alternately from each side. Considerable differences in the degree of pupillary reaction suffice to demonstrate a hemianopic reaction.

The same is present solely when the optic-nerve fibres are interrupted in the tract. The fibres for the pupillary reaction, which are different from the optic fibres, separate from the latter at the central end of the tract in order to enter the nucleus of the third nerve. A focus central to the primary optic ganglia and causing hemianopsia will fail therefore to produce hemianopic pupillary reaction.

So the clinical findings of the first examination enabled me to localize the lesion in the right optic tract. The mode of regression of the symptoms was very peculiar. I had never observed it previously, nor do I know of any one having reported a similar occurrence. It enabled me to localize the site of the lesion almost to the millimetre.

On the 29th of August, movements of the hand were seen in the left lower quadrant of the left eye; in the right eye complete hemianopsia persisted. On the first of September the ordinary test object of 1*cm* square was recognized in this quadrant; field of right eye unchanged.

The 6th of September, left eye further improved, colors recognized in left lower quadrant; in the upper half of the right and left field the line of separation has extended a little into the blind halves.

September 15th, no change noted in fields, temporal halves of both disks a little pale.

September 26th, colors normal in left lower quadrant, movements of hand in upper quadrant; field of right eye unchanged.

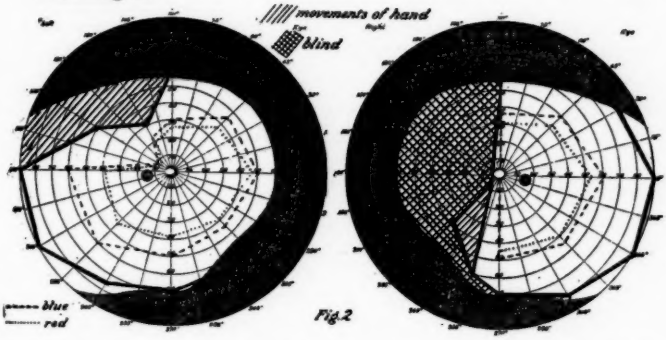

Fig. 2

October 10th, test objects seen in central parts of left upper quadrant of left eye; color-sense is still entirely lacking in this quadrant. In the right eye the whole line of separation has extended a little into the blind half; movements of hand seen in lower octant.

October 20th and November 10th, slight increase in both fields; colors recognized in central part of left upper quadrant. Temporal half of right disk quite white; nasal half about normal. Left disk distinctly discolored in its totality; temporal half paler than nasal.

January 12th, no change whatever.

These incongruities in the regression of symptoms seem to conflict with our conception of the course of the crossed and non-crossed bundles of the optic fibres. They lend themselves readily, however, to a full and satisfactory explanation when we consider the researches of Bernheimer.

Bernheimer has proven that the crossed optic fibres occupy mainly the lower part of the chiasm, whereas the non-crossed fibres are restricted to the upper half and form a closed bundle. The relation remains the same in the adjoining part of the optic tract; the non-crossed fibres occupy the upper, the crossed

ones the lower, part. This is the case but for a very short distance. A few millimetres farther central both bundles are mixed so thoroughly, that the fibres lie nearly alternating.

In the case I present the crossed fibres—going from the right tract to the nasal half of the left retina—recovered rather rapidly and completely, whereas recovery was slow and incomplete in the non-crossed fibres of the same tract—going to the temporal half of the right retina. We must conclude, therefore, that the lesion is situated in the non-crossed fibres with more or less destruction of the fibres, whereas the paralysis of the crossed fibres must be interpreted as due to mechanical pressure of the effused blood or collateral œdema, or a similar effect of the supposed primary hemorrhage. The crossed fibres were not destroyed at any rate, but only temporarily paralyzed. The diagnosis must be therefore: Hemorrhage in the upper half of the right optic tract immediately behind the chiasm.

THE OPERATION OF EXCISION OF TARSUS AND CONJUNCTIVA (HEISRATH) IN OLD TRACHOMA, TOGETHER WITH DEMONSTRATION OF A NEW INSTRUMENT, AND A DESCRIPTION OF A NEW METHOD OF PERFORMING IT.[1]

By J. HERBERT CLAIBORNE, M.D., New York.

(With six illustrations in the text.)

IN the Archives of Ophthalmology, March, 1910, Dr. H. W. Wootton described the combined excision of tarsus and conjunctiva in cases of old trachoma as performed by Heisrath, and accompanied it with illustrative diagrams. He referred to the present status of this surgical procedure, particularly in eastern Prussia. He also referred to the exsection of the tarsus without the sacrifice of the conjunctiva. He pointed out that these operations had met with but little favor outside of eastern Prussia, where they have been performed for the last ten or fifteen years. They are said to have yielded from 50% to 60% of cures and to have practically afforded immunity from infection.

Kuhnt, who was at first an opponent of excision, became an ardent advocate of it, first through necessity, and secondly by reason of the success the measure found in his hands. It is rather natural that any such radical surgical procedure as this should have had its origin in eastern Prussia, which is one of the most fertile soils for trachoma. Conversely, it is not surprising that the procedure should have found small favor in England and America, to which countries, it may be said, trachoma is not indigenous, but rather an importation. The great success which has been attained

[1] Read in part at meeting of Am. Ophthal. Soc., 1911.

in this country in the treatment of trachoma by expression has naturally led surgeons away from a more radical procedure. Expression has been considered as indicated in trachoma which is in the florid stage, or in that which is marked by cicatrization with abundant granulations.

It is well known, however, that in the later stages of trachoma the results from expression are disappointing. Those of us who have kept careful records of our cases know that trachoma recurs even after the most thorough expression in even selected cases. Whether this is due to infectious material being left after the operation or to reinfection endemically from the same source, it matters not. It is simply a fact.

When the paper of Dr. Wootton was read at the New York Academy, I opened the discussion on the subject. A number of cases were shown in which the operation had been performed, and I observed that granulations persisted in many cases. Nevertheless it was assserted that the cases had been much benefited. Of this point at that time I could not comvince myself, as I had not seen the cases before. But I could see that keratitis was lacking in the majority of them or was slight in degree, and that there was no pannus, though I had been informed that all these symptoms had been present.

Now, it was claimed that the operation had cured the disease, whereas if granulations of a typical character on the conjunctiva constitute trachoma, the disease was not cured. I confess I returned from the discussion with grave doubt as to the efficacy of the operation and a profound conviction that it was a bad surgical procedure to remove the tarsus and overlying conjunctiva. Nevertheless, in view of the evidence of several reputable witnesses, I determined to try the operation.

The first case in which I tried it was that of a young man of twenty-six, an Irishman, who had had trachoma from childhood. There were no granulations whatever on his lids, but his right cornea was in a condition of ulceration with mild pannus. His upper lid was much scarred and contracted, and his fear of light was so great that he had not been able to work at all for more than a year. I persuaded him to let me do the operation of combined excision,

describing the nature of it and the status of opinion in regard to it. He did so, and I performed the combined excision on his right eye. The operation was ragged owing to my lack of knowledge of the technique; but, to cut the matter short, in a month the eye had healed, his pain and fear of light were gone, and he went to work. He was comfortable, and at the end of several months asked to have the other eye done. He is now happy, entirely without pain, and is a useful member of the body politic. Without the operation he could never have been so, in my opinion.

It is unnecessary to go into details of other cases. Suffice it to say they were cases of old trachoma marked by ulceration, pannus, fear of light, pain, and dim vision. A number of them had persisted for many years, three from childhood. Remarkable results as to relief of all these symptoms were obtained in all the cases, and no other means, I believe, could have achieved the same results. All the operations were done by my colleagues and myself at the New Amsterdam Eye and Ear Hospital. Dr. Wootton thinks "the combined excision is indicated in the severe trachoma of adults, *in all stages except the cicatricial* [italics my own—J. H. C.], and is especially to be recommended when corneal complications are threatening or present."

I feel compelled to take marked exception to this view in some respects. If there is one class of cases in which the combined excision is indicated, it is in the purely cicatricial or the cicatricial form combined with granulations. Indeed, I consider it indicated in all cases of trachoma, such as are known to us all, in which cicatrization has commenced and pannus and keratitis are present. I think it ought not to be performed in any case in which granulations are sufficiently abundant to justify expression, unless the disease has several times repeated itself after the operation.

In order to illustrate his article, Dr. Wootton shows a case of exuberant granulations apparently without cicatrization. The picture is doubtless schematic, but it illustrates just the kind of case which, in my opinion, is suited for expression, and in which the combined excision is contra-indicated. Perhaps it might be advisable to operate on such a case in eastern Prussia, but certainly not in New York, unless expression had been thoroughly tried and had failed.

It is no light thing to remove the tarsus and the overlying conjunctiva in any case, and if it is done, it should be only as a last resort.

It may be argued that blue-stone will cure such cases as I have described, and that therefore combined excision is not indicated in them either. To that I would answer that blue-stone, with rare exceptions, never does cure trachoma, for such cases do not remain under care long enough to be cured. Most of our cases are of years' standing, as a rule occur in old people, and radical means are justified by the circumstances.

Just here I wish to declare myself as opposed to the resection of the tarsus without sacrifice of the conjunctiva. In those cases in which it is possible to resect the tarsus and leave the conjunctiva, I believe expression should be employed, for I am abundantly convinced that it is not possible to resect the tarsus successfully when cicatrices have formed. If expression fails, the combined excision is indicated. I wish to oppose also the combined excision or the resection of the tarsus of the lower lid. I cannot conceive why it should be done. It is well known that all the harm done the eye in trachoma is caused by the upper lid, and that the lower lid does none except at times when it is the site of symblepharon bands.

I have seen a case recently in which there was pannus, keratitis, ulcers, and symblepharon on upper and lower lids. The combined excision was done on the upper lid, with complete relief of all symptoms, which had persisted for forty years. The lower lid was not touched, and the bands are still present, but there is no discomfort. If there are granulations on the lower lid, they should be expressed; if none, it should be let alone. We are all inclined to carry radical measures too far when once we become radical.

I have seen the method of Heisrath, as described by Dr. Wootton, performed by several surgeons, and I have done it a number of times myself. It is tedious, bloody, takes a long time, and requires a number of hands besides those of the operating surgeon.

The operation, as indicated below, by means of my clamp forms a striking contrast with the method of Heisrath. It

is only necessary to have an assistant to hand the instruments and sutures. The operating surgeon's hands alone are around the eye.

The clamp as shown is the final result of a number of experiments. I several times tried a clamp without spikes, but it slipped from the lid after the plate had been screwed down. The suggestion as to the spikes was made by my colleague, Dr. E. B. Coburn.

In a recent issue of the *Ophthalmoscope* there was published a picture of a clamp made for this purpose by Cyril Shepherd, of Australia. Shepherd and I evidently had the same idea, but from the picture which he published I cannot understand how the operation could be successfully performed. The plate is too large in his instrument, and it could not hold the lid in position. I tried his idea during the process of my experiments, but it failed utterly. This was before I had seen the cut of his instrument.

I read my paper and showed my instrument before the Section on Ophthalmology, New York Academy of Medicine, on December 19, 1910, whereas his article was published in the *Ophthalmoscope* on February 1, 1911. It happens, therefore, that I have the priority in the matter of the publication.

My experience in this operation convinces me that the tarsal cartilage in a cicatricial state is the cause "of all our woe" in old trachoma—but only in the cicatricial state. It may be said approximately that *the tarsus is old trachoma.* I frankly believe that all the granulations possible in an eye from which the tarsus has been removed, could not produce the picture which we know as old trachoma or destroy the sight of the eye. Without the tarsus, I believe the granulations are practically innocuous.

This would appear to be an argument in favor of the "auschällung" of Kuhnt, but really it is not, since non-cicatricial trachoma can always be cured finally by expression combined with proper after-treatment.

Description of Clamp and Operation.

The clamp (Fig. 1) is in effect a modification of Desmarres's. It consists of a fork with five spikes, four as seen in the cut,

the other at the base, where the shank branches. The plate upon which the fork descends is of metal and is 4*mm* shorter than the forks. The spikes fit into fenestræ. These fenestræ are made primarily to receive the spikes when the clamp is

FIG. 1

FIG. 2.

closed and not in use. The shank is curved to fit over the brow.

Figure 2 shows the clamp in the primary position. To enter the prongs accurately and successfully it is well to lift the centre of the lid by grasping it with a pair of conjunctival forceps or the fingers. The right prong is then slipped under the lid and the left one afterward. Both prongs are now thrust well toward the supraorbital ridge. The prongs being well in position and the skin having been smoothed out, the fork is screwed tightly down by the ratchet upon the lid.

The clamp is then reversed and laid over the brow, as in Figure 3. The conjunctival surface of the lid is now exposed and the section is made as shown by the continuous line. The curve of the prongs is the guide of the incision, and it should commence well down on one side and be carried over to a corresponding position on the other. As the knife cuts down

upon the tarsus the latter springs away from the underlying tissue by virtue of the tension. The tarsus with overlying conjunctiva is dissected up and the conjunctiva of the fornix is well loosened by further dissection, to gain slack. This is to relieve pull when the conjunctiva is stitched to the lid. Owing to the pressure, the hemorrhage amounts to nothing.

The stitches are inserted as in Figure 4. The line of the stitches lies parallel with the lower edge of the tarsus, and not

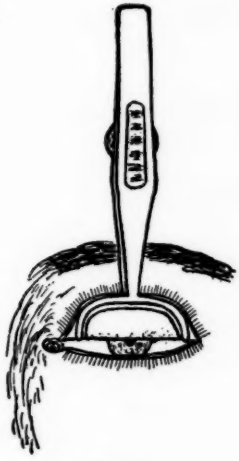

FIG. 3.

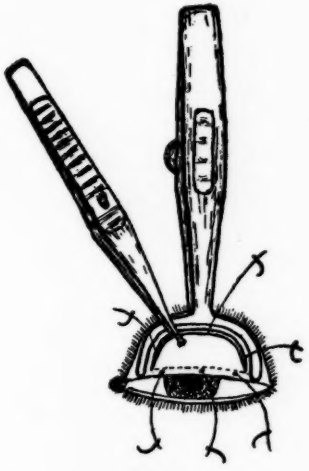

FIG. 4.

at right angles to it. The threads are double-armed and should be about ten inches in length. They should be placed on a tray together with a needle-holder, separate from the rest of the instruments. The central sutures are put in first. The dissected tarsus, covered by conjunctiva, being grasped by the forceps and slightly put on the stretch, one needle and then the other is passed through the fornix conjunctivæ, just below the dotted line indicating the limit of the tarsus, and both threads are laid on the centre of the brow. The lateral stitches are next taken, and they too laid on the brow, care being taken to draw the nasal ones toward the nose and the temporal ones toward the temple. This is, of course, done to

prevent the mixing of the threads. The tarsus is now grasped by the forceps, lifted slightly, and is cut away with a pair of scissors just above the line of the suture. The clamp is then removed. A slight bleeding takes place, but it ceases in a few seconds. The sutures are now laid upon the cheek, the centre of the lid is grasped by a pair of conjunctival forceps, and the needles of the middle sutures are passed through to the cutaneous surface, emerging on the skin 4 to 5*mm* above the ciliary border of the lid. The needles of these sutures are removed and the sutures arranged neatly in the centre of the

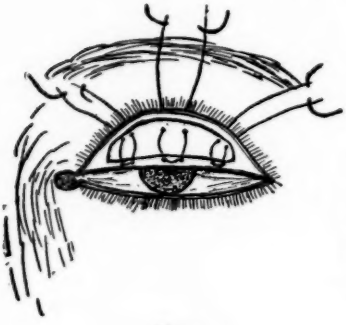

FIG. 5.

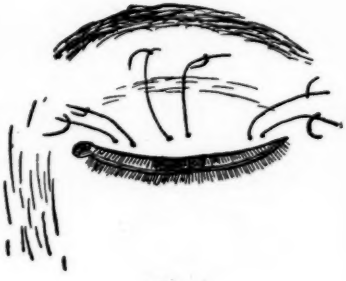

FIG. 6.

forehead. The lateral ones are then put in a similar manner, but lie 2 to 3*mm* nearer to the lashes than the middle ones.

Figure 5 shows very clearly the position of the sutures after the tarsus has been excised as one looks upon the everted lid.

Figure 6 shows the appearance of the sutures when they have emerged upon the cutaneous surface. It has been my custom of late, however, to pierce the skin still a little farther away from the lashes in case of both lateral and central sutures. My object in carrying the central sutures a little higher than usual is to increase the depth of the upper cul-de-sac to prevent symblepharon and to prevent the lifting of the centre of the lid, which is apt to occur if the central stitches are placed too near to the lashes. The stitches are tied upon small rolls of wet cotton to prevent them from cutting into the skin and to facilitate their removal. This done, the frayed ends of the

cotton rolls are cut off neatly and the operation is finished. The entire operation can be done in ten to fifteen minutes.

This method of performing the combined excision differs from that performed by the Kuhnt-Heisrath method in several respects:

1. It is practically bloodless.
2. It can be performed in ten or fifteen minutes.
3. The extent of the incision is outlined by the curve of the forks of the clamp.
4. The line of the sutures is not at right angles to, but is parallel with, the border of the lids.
5. The central sutures are set farther from the ciliary region than in the other operation; in this way the tucking of the lid in the centre is avoided and a deeper fornix insured.
6. The hands of the operator alone are around the eye.

A REPORT OF A CASE OF ANTRAL DISEASE IN A FOUR-MONTHS-OLD CHILD, WITH MARKED ORBITAL SYMPTOMS.[1]

By FREDERICK KRAUSS, M.D., PHILADELPHIA.

Anna Yokoszak was born Feb. 15, 1911, and was admitted to St. Christopher's Hospital for Children on June 5, 1911, suffering from proptosis of the left eye associated with swelling of the left side of the face.

The family history is negative.

The child's birth was normal, with no instrumentation. When the child was one month old it had a severe cold with much white secretion from the nose. The eye was unaffected, and the child made an apparent recovery. One week before admission, the child was fretful, cried a great deal, and appeared to have a severe cold in the head.

In a few days the left cheek and eye became much swollen, the attending physician applying a black salve over the face. The swelling grew in intensity, with much discharge from the nose, causing the child to be brought to the hospital. There had been no traumatism.

Present Condition:: Child weighing fifteen pounds, restless and crying. On admission the temperature was 100° F. The left side of the face was greatly swollen with much œdema of the lids. The eye was greatly proptosed, with movements greatly restricted. Down and out in the orbit was an appearance of tumor suggesting inflammatory origin. The nasal mucous membrane was much swollen, showing much pus, especially in the left nostril. Examination of the mouth showed mobility of the palatal plate of the left superior maxillary bone. In the alveolar process of the superior maxilla on the left side, at about the site of the first bicuspid was a minute granulating spot which, upon probing lightly, exuded pus rather freely. With but slight effort a groove director was passed along the sinus to the

[1] Read before the Ophthalmic Section, College of Physicians, Philadelphia, Dec. 21, 1911.

sinus maxillaris. Upon enlarging the opening with a curette the bent probe could be passed to the outer part of the orbit into the tumor. Much free pus was evacuated. After making a counter opening into the nose, the cavity was washed freely with boric acid solution and packed with iodoform gauze.

In curetting the sinus, two large, well developed teeth were brought forth. Each tooth measured approximately one quarter of an inch in length and was quite hard.

Diagnosis:—Acute maxillary sinus disease with perforation into the orbit and mouth.

Treatment consisted of daily washing of the sinus followed by packing with iodoform gauze. Later, on account of continued loss of weight and refusal of food, a packing wet with a weak bichloride solution was substituted. The swelling rapidly disappeared. There was some exfoliation of small fragments of bone. No incision into the orbit was made until several weeks later, when a small sluggish abscess which had remained was opened. The drain was removed in two days.

The patient was discharged cured on July 17, 1911, six weeks after admission to the hospital, demonstrating the rapidity with which these patients recuperate after thorough drainage.

The above case is interesting because of the extreme youth of the patient, less than four months old, and the extensive affection of the superior maxillary bone. Either the inflammation was intense, or the resistance of the bony tissue was very slight to allow perforation into the orbit, and the alveolar process. There was also a temporary loosening of the palatal process of the superior maxillary bone, allowing motion.

The question arises as to whether this is a case of antral disease or general osteomyelitis affecting the maxillary bone. Antral disease in infancy seems to be uncommon.

L. A. Coffin reports a case somewhat similar to this occurring in the left eye of an infant six months old, in which there was a history of injury. There was exophthalmos, which disappeared after evacuation through an incision in the orbit. An opening was then made through the canine fossa. The author believes with Avellis that this is not a true case of antrum disease, but rather a general osteomyelitis. Coffin concludes from the twelve to fifteen skulls of infants and still-born from the sixth month on, and from a review of the litera-

ture on the subject, that only two accessory sinuses are present at birth, the ethmoid and maxillary antrum. He quotes Turner to the effect that the maxillary sinus exists at birth, and measures 7*mm* in the vertical diameter, and 3*mm* in the transverse diameter. In infancy and largely in childhood this small sinus occupies a position relative to the orbit, entirely different from that when the sinus is fully developed. During this time, the body of the maxillary bone is so constructed that the sockets of the teeth are almost in contact with the orbital plate of the sinus maxilla, forming the floor of the orbit. There is therefore no maxillary sinus beneath the orbit. Onodi in his recent work on the nasal sinuses in children has found that the maxillary sinus has been present before the first half of fœtal life. In a six-and-one-half-months-old fœtus, the antrum was 3*mm* long by 1½*mm* wide, and in the first year of life it varied in size from 5 to 19*mm* long, 3 to 9*mm* high, and 3 to 8*mm* broad. These measurements show the possibility of the maxillary disease in the infant. The extension of the inflammation to the surrounding tissue is faciliated by incomplete development of the bones of the face. It was formerly believed that the nasal sinuses developed much later in child life, but Onodi shows that the frontal cells have been found in an eight-months-old fœtus in the shape of a large recess. which emptied into the anterior end of the semilunar hiatus. Practically all of the nasal sinuses are present in the first year of life, though the size of each varies in the individual. In our case there was a clear history of antral infection following acute coryza. This history was taken by a resident physician who did not suspect sinus disease. There was no history of trauma. The disease was limited to the left side of the face, and disappeared after the antrum was opened freely. It is my belief and experience that such cases have frequently escaped correct diagnosis. They are treated as erysipelas, with later extension to the brain, unless by good luck external perforation saves the patient. When perforation occurs, some specialists have diagnosed them as osteomyelitis, because it has been thought that the nasal sinuses are a later development of child life.

REPORT OF THE PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

An ordinary meeting of the Society was held on Thursday, December 14th, Mr. J. B. Lawford, President, in the Chair.

Mr. Edridge Green showed a **new simple test for color blindness,** and Mr. C. D. Marshall regarded it as a great advance in accuracy of testing, as it provided for all the colors which a candidate could be expected to name. Mr. H. Levy showed a case of **exudation into the canal of Cloquet,** and one of **dystrophia adiposo-genitalis with optic atrophy.** Mr. W. H. McMullen exhibited a case of **nearly complete congenital external ophthalmoplegia.** Mr. A. S. Worton showed a **punctate crystalloid deposit in both corneæ,** and Mr. Bishop Harman a case diagnosed as **retinitis circinata,** but which disappeared in a year. Mr. Grimsdale showed a case of **cyst of iris,** and Mr. Greeves a case of **sixth nerve paralysis in a child after acute polioencephalitis.** Mr. McMullen showed **an example of retinal disease with massive exudation.** Mr. Lister showed a **pigmented conjunctival growth.** Mr. Hewkley brought forward a case of **punctured wound of the cornea, with edges of wound stained with ink.** Mr. C. D. Marshall showed, for Mr. Ridley, **a scotometer.**

Dr. Thomson Henderson read a paper entitled **The pathogenesis of choked disk.** He said that the brilliant results obtained by cerebral decompression had conclusively proved that the manifestations of choked disk were the direct expression of the mechanical agency of increased intracranial pressure. In choked disk the intraocular pressure was normal, while the intracranial pressure was raised, and therefore to

appreciate the essential relationship between cause and effect it was essential for us to possess a clear and definite conception of the physiological association between the normal intraocular pressure and the normal intracranial pressure. He had experimentally demonstrated that under physiological conditions the intraocular and intracranial pressures were similar in nature and in level. The condition of venous engorgement and of swelling of the disk which together completed the ophthalmoscopic picture of choked disk were both the result of the sudden break at the level of the lamina cribrosa of the physiological equilibrium of pressure which normally existed at this point. When the intracranial pressure was raised, the cerebral venous pressure mounted to the same level, and therefore the pressure in the neural portion of the retinal vein likewise rose; hence, to complete the retinal circulation, the pressure in the intraocular portion had to rise *pari passu*, thereby producing the retinal venous engorgement. As fluids tended to lie at the lowest hydrostatic level, and as the hydrostatic pressure behind the lamina cribrosa was greater than in front, fluids passed forward into the now lower hydrostatic level of the eye, and so caused swelling of the disk. The arching forward of the lamina cribrosa, and the so-called hydrops vaginæ represented a yielding of those structures to the increased hydrostatic pressure they were called upon to support. As the brain acted as a viscous and not a fluid mass, and further as the rigidity of the falx and tentorium tended to hinder general diffusion of hydrostatic pressure, the pressure in one cerebral hemisphere and corresponding optic nerve might rise above that in the other, thereby accounting for the ipso-lateral feature of choked disk. The paper was discussed by Mr. HERBERT PARSONS, who considered that on logical grounds Mr. Henderson's contention did not hold good. He believed that pressure was not a question of volume in the sense in which Dr. Henderson meant it. If the intraocular pressure were identical, physically, with intracranial pressure, then admittedly the intraocular pressure would be equal to the intraocular venous pressure. For the intraocular pressure to be always equal to intraocular venous pressure would mean absolute rigidity of the cornea and sclera. That was where the fallacy lay. There was evidence

that the sclera was not quite rigid. He did not believe a purely physical explanation could be given either of glaucoma or of increased intracranial pressure; physiological factors must be taken into account. Mr. J. L. PATON regarded Dr. Henderson's paper as a return to the crude original ideas published in the 'sixties, only modified by an application to the explanation of venous congestion published by Dr. Leonard Hill in 1896. Venous pressure alone did not suffice to account for the phenomenon of choked disk, and in this connection he mentioned the example of thrombosis of the central vein. He asked the author in what proportion of the cases of optic neuritis which he had examined he had seen the arching forward of the lamina cribrosa. Out of sixty eyes in which there was optic neuritis, in only one was there that arching forward of the posterior fibres of the lamina cribrosa. Dr. GORDON HOLMES thought it remarkable that when such views as in this paper were put before a scientific Society, the facts also were not given. He proceeded to discuss the question of the disassociation between intraoptical and intracranial pressure, and regretted that the question of ipso-laterality had not been considered more quietly. Dr. HENDERSON replied that Schencks had experimentally produced ipso-laterality. Foulkes had described the cornea and sclera as rigid.

Dr. ADOLPH BRONNER read a paper entitled **Notes on three cases of ulcer of the cornea combined with painful spasm of the sphincter pupillæ.** In the first case the severe pain persisted, in spite of all ordinary methods of treatment, from October 9th to November 21st, when an iridectomy was performed which gave immediate relief, and the ulcer healed in four days. In the second case the symptoms persisted from June until August, when an iridectomy again gave immediate relief. The third case persisted for three months and was at once cured by an iridectomy. The peculiarity of these cases was that the ulcers were superficial, often traumatic, not infiltrated, and did not heal, in spite of the usual methods of treatment, for several weeks or months. The pain and photophobia were also more severe and more intermittent than usual, and at once ceased after iridectomy. The chief peculiarity, however, was that the pupil did not dilate with atropine, and that often the pupil of the other

eye did not act as readily as usual. The fact that the iris was not infiltrated, that there was no lymph on the anterior capsule, and that the pupil dilated after iridectomy, proved that there had been no severe iritis. Probably the unusual symptoms were due to neuritis of the nerve endings in the cornea, which caused reflex spasm of the constrictor pupillæ muscle, and this, in turn, possibly prevented the ulcer from healing. The President said the treatment seemed rather like a return to the methods of former days. He recounted the case of a gentleman who had been under the care of several ophthalmic surgeons for ulcer, but without success until the patient went to the late Mr. GUNN, who did an iridectomy, and the patient promptly got well. Mr. RICHARDSON CROSS suggested the use of the cautery and tapping the eye before making the radical excision. Dr. HARRISON BUTLER said that in almost every serious case of ulcer which he did not cure by other means he obtained a favorable result by a Saemisch section. Dr. BRONNER replied that he used the cautery in one case but it did no good. Of course he did not suggest that iridectomy should be done in every case of corneal ulcer. The cases he had related were not septic ones.

REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. MARTIN COHEN, Secretary.

MEETING HELD MONDAY, OCTOBER 16, 1911. DR. H. W. WOOTTON IN THE CHAIR.

EXECUTIVE SESSION

The election of secretary to fill the unexpired term of Dr. E. B. Coburn, deceased. Dr. Martin Cohen was elected.

It was moved and seconded that a resolution in memory of the death of Dr. E. B. Coburn be drawn up by the Secretary and a copy forwarded to members of the family.

Regularly moved and seconded that the Secretary be instructed to request from the Board of Trustees of the Academy the purchase of a microscope for the use of the various Sections at their meetings.

At a regular meeting of the Section on Ophthalmology of the New York Academy of Medicine, held on October 16, 1911, the following preamble and resolutions were unanimously adopted:

Whereas, it has pleased an all-wise Providence to remove from the sphere of his earthly activities Dr. Edward Bernard Coburn, our late Secretary and esteemed colleague, an able physician and a Fellow of the New York Academy of Medicine, be it

Resolved, That the Section on Ophthalmology of the New York Academy of Medicine tender its heartfelt sympathy and condolence to the relatives and friends of Dr. Edward Bernard Coburn in the affliction which they have sustained, and hereby record the deep sorrow and regret which the Section feels in the demise of an esteemed co-laborer in the field of Medicine, devoted to the relief of human suffering.

RESOLVED, That these sentiments be spread on the records of this Section and a copy thereof be transmitted to the family of the deceased.

H. W. WOOTTON, *Chairman.*
MARTIN COHEN, *Secretary.*

SCIENTIFIC SESSION

Dr. H. H. TYSON presented a case of **keratitis disciformis.** Patient, male, age 37 years, applied for treatment at the N. Y. Ophthalmic and Aural Institute, October 3, 1911, on account of poor vision in left eye. He stated that about five weeks ago upon awakening in the morning he noticed that his left eye was inflamed. Cold applications were made for a day with no change in condition; he then applied hot applications with no improvement, then for a few days he alternated with hot and cold applications resulting with no change in the condition; he then visited an eye clinic in Brooklyn and remained there one week with no change in his condition, he then returned to the N. Y. Ophthalmic and Aural Institute. One week later, examination revealed an inflamed eye with a dilated pupil. The centre of the cornea was hazy, due to a diffuse infiltration in its middle layer, sharply circumscribed and disk-shaped, near the centre of which were two spots more intensely clouded, and over which appeared a minute line-like abrasion, as if indicating point of entrance of infection. Marked circumcorneal injection, photophobia and irritative symptoms. Vision left eye: counts fingers at ten feet. Fundus barely perceptible. Right eye vision $\frac{20}{30}$. Corneal sensibility of left eye reduced. No history of traumatism. Wassermann reaction was negative. Diagnosis of keratitis disciformis was made, and atropine and hot bathing were prescribed, with sodium salicylate internally. On Oct. 12th, centre of opacity appeared a trifle clearer, but the rest of the infiltration seemed more diffuse, and vision has decreased to $\frac{5}{200}$. As Fuchs had stated, the course of the disease is a protracted one, varying from one to several months, before the eyes are free from congestion and the infiltration becomes transformed, leaving a permanent corneal opacity.

Dr. SCHIRMER had also observed and reported cases follow-

ing corneal infection by vaccine virus in cases of vaccine blepharitis. In many cases, as in this instance, the cause is unknown, but supposed to be infection with micro-organisms from outside gaining entrance through slight traumatism.

Discussion: Dr. SCHIRMER stated that he was able to produce experimentally in the guinea-pig's cornea a condition similar to keratitis disciformis by vaccine virus.

Dr. WEIDLER asked if there were any pathological examinations made in any of these cases. Dr. SCHIRMER responded by stating that Dr. Peters found necrotic tissue in the deeper layers of the cornea, while Professor Fuchs found scar tissue formation.

Dr. H. H. TYSON presented a case of **fibro-angioma of the lid.** Patient, female, age 22 months, was brought to the Vanderbilt Clinic one week ago. Mother noticed at birth a red spot on right upper lid and one on forehead over root of nose. This latter disappeared as the child grew older, while that on the lid became more prominent about one month ago. Mother noticed small lumps in right upper lid which were soft to the touch, but of late had been gradually becoming harder. A clinical diagnosis of telangiectasis and angio-fibroma was made, and removal of growth advised by extirpation and electrolysis.

Discussion: Dr. Johnson believed electrolysis should be tried when the growth was small, galvano-puncture when large.

Dr. JULIUS WOLFF presented a patient with **restoration of orbital socket by means of a Wolff graft.** Patient, female, had right eye enucleated when 16 years old. Wore artificial eye for a time. Complained of epiphora and was told to use alum in the socket, which she did for several years, causing the cavity to shrink considerably. Prolonged forcible attempts to introduce artificial eye caused injuries and resulting cicatrices. An operation performed to make more room resulted in making the condition still worse. When seen by him, August 25, 1911, there was complete symblepharon, upper and lower lids being united close to their edges everywhere, except at a small area between the outer and middle thirds of the palpebral fissure, where a probe could be introduced into a very small space for about ½ inch. There was no space whatever for an artificial eye.

First operation August 30, 1911. General anæsthesia. Separation of lids and division of numerous cicatricial bands, as several recesses were found extending in different directions. Upper and lower lids were undermined till a cavity was formed into which a glass shell 1 in. × ¾ in. was introduced. No grafts inserted. Lids closed with adhesive plaster; bandage.

Second operation September 6, 1911. Wound being in a healthy, granulating condition, lower cul-de-sac was enlarged down to orbital margin. Wolff graft 1 in. × 1¼ in. taken from leg, and raw surface laid out over edge of the largest reform eye, so that the cavity formed would hold. This was pushed into the lower cul-de-sac and held in place so tightly that no sutures were used. Daily external dressings, but glass eye not removed till eighth day, when whole flap was found to have become attached.

Third operation September 30, 1911: Upper cul-de-sac formed and treated in same way as lower one at second operation. Graft used was 1¼ in. × 1½ in. and in place of glass shell a lead disk with central perforations was used as a splint and covered at its edge with rubber tissue. No sutures. Graft found adherent on eighth day. Since then an artificial eye has been worn with excellent cosmetic result. Although the grafts may still shrink somewhat, there is ample room for an artificial eye. He recommended in similar cases a preliminary operation to obtain a granulating surface, the removal of all fatty and elastic tissue from the flaps and the use of perforated lead disks as splints.

Discussion: Dr. JOHNSON asked how the graft was prepared, whether there was much secretion, and how the flaps were retained.

Dr. HELLER inquired if the operation could be done in one sitting.

Dr. CRIGLER reported failure of the operation in most of his cases, though proper technique was employed. He thought the bad results probably due to infection.

Dr. WOOTTON also reported failure of operation in three cases; he thought it important to have the Wolff graft as thin as possible, to avoid elastic fibres, and did not believe in suturing where it was possible to avoid it. Reported also one case of recent Thiersch graft.

Dr. SCHIRMER said that he preferred Wolff's grafts as they did not shrink so much as the Thiersch graft. The important points in the operation were, he said: asepsis; thin flaps; not to touch flaps with forceps; immediate transplantation; and removal of all scar tissue.

MEETING HELD MONDAY NOVEMBER 20, 1911, DR. H. W. WOOTTON IN THE CHAIR.

EXECUTIVE SESSION

It was regularly moved and seconded that a copy of the Resolution read by the Secretary be sent to the family of the late Secretary, Dr. E. B. Coburn.

Nomination of Officers for the ensuing year.—Dr. J. R. SHANNON was elected Chairman and Dr. MARTIN COHEN Secretary for the ensuing year.

SCIENTIFIC SESSION

Dr. W. B. WEIDLER presented a case of **lupus erythematosus,** which had been treated with carbonic acid snow. The case had first been diagnosed as a blepharitis marginalis and treated in the usual manner. When after a prolonged treatment with various ointments there was no permanent improvement, carbonic acid snow was applied which produced an immediate blanching of the surface treated, and the applications were proceeded with. The case was presented in order that fellow practitioners may follow this course of treatment. There was no discussion.

Dr. WEIDLER next presented a case of **pseudo-paralytic ptosis of the levator palpebralis.**

The eyelids on both sides are usually open in the morning, but later there is drooping on the right side. There is transient diplopia and the corneæ are hypersensitive. The field shows dischromatopsia again, which has previously been present in each eye alternately. Sudden fright, with both eyes closed, causes patient to open both eyes equally wide, but in about forty seconds the right lid begins to fall.

Discussion: Dr. CUTLER asked if the cornea had been protected, to which Dr. WEIDLER replied in the negative.

Dr. WOOTTON had never seen a similar case, but from the

history of the case he did not think it one of pseudo-paralysis. He thought the affection went from one eye to the other.

Dr. OTTO SCHIRMER read the next paper on **A case of incongruous homonymous hemianopsia.** (This paper is published in full in this number of these ARCHIVES.)

Dr. W. P. EAGLETON reported a case showing the possibility of **exploring the orbital contents** from behind **through the cranial fossa.** Patient, a man 60 years of age, had a bullet wound a little above the roof of orbit, about two inches posterior, the track running forward and downward. When admitted, he was drowsy and slightly delirious. Marked exophthalmos with great chemosis, chiefly below. Motion of eyeball limited, but able to move in all directions. Cornea clear. Pupil did not react to light. Ophthalmoscopic examination showed hemorrhage into the vitreous and whitish muddy hue of retina, such as is seen in Berlin's œdema.

With the X-ray the bullet was seen to be in two pieces, lying side by side 32*mm* behind centre of cornea, 8*mm* above, and 2½*mm* to temporal side. Incision was made down through the skin about 1½ inches behind the orbital margin. The temporal fascia and muscle were split longitudinally in the direction of their fibres. The bone in the temporal fossa was removed and the anterior fossa of the skull opened in its anterior and external portion. The dura was lifted, the roof of the orbit opened, following the track of the bullet, which was entirely extradural, and the contents of the orbit easily inspected. Both bullet pieces were easily extracted by forceps. The exophthalmos disappeared within a few days. The eye now presented the ophthalmic picture of hemorrhage into the optic sheath.

The case was presented to show the ease with which this route could be used in exploration of the orbit, as it gives a good exposure behind the eyeball, without its removal.

X-ray plates were exhibited.

In the discussion Dr. MARPLE asked if the X-ray plates showed the proper localization of the foreign body.

Dr. WEEKS thought the line of the wound did not allow for proper drainage.

Dr. ELLICE M. ALGER reported a case of **occlusion of central artery of the retina.** Patient was an Italian barber,

aged 60, with a history of alcoholism and syphilis. He suddenly lost the sight of his left eye completely; after an hour, vision gradually returned, but a week later had a similar attack. A month ago the third attack resulted in complete blindness. Examination showed a complete collapse of the retinal circulation. The diagnosis was between embolism and obliterating endarteritis. Against the first are the two prodromal attacks and absence of heart lesions; for it, his age and previous history. The treatment was with mercury and iodides, under which the vision gradually cleared up and patient says that the right eye is now as good as the left even in youth.

Dr. ALGER'S case was discussed by Dr. MARPLE, stating that prognosis was bad in his opinion.

Dr. MARTIN COHEN presented a paper entitled: **Noguchi's cutaneous luetin reaction and its application in ophthalmology.** (Published in preceding number of these ARCHIVES, January, 1912.)

Discussion: Dr. HIDEYO NOGUCHI described the method of preparation of the emulsion of killed treponemæ pallidæ to which he had given the name "luetin." The results of experiments with the cutaneous test on animals previously inoculated with syphilitic virus were soon to be published, as well as the results obtained with the test in human beings. Dr. Cohen and he had injected luetin intradermatically in non-syphilitic individuals suffering from minor ailments and various infectious diseases; apparently this inoculation was harmless, and since the test was almost uniformly negative in these patients, it could be regarded as of considerable negative value. As to the positive value of the luetin test, basing his conclusions on 177 cases, Dr. NOGUCHI said that the test often failed in primary and secondary cases, but was almost constantly positive in hereditary and tertiary syphilis.

Dr. M. J. SCHOENBERG read a description of experiments which he had performed nearly a year ago. He was among those who had had the idea of trying the reaction of the skin to the local application of the syphilitic virus, and he believed that the theoretical considerations for the application of this test were stronger and more plausible than those which Von Pirquet had employed in the tuberculin skin test. Dr. Schoenberg had used as antigen the standard solution of

antigen usually employed for the Noguchi modification of the Wassermann reaction and also salvarsan. The results obtained were not very satisfactory.

Dr. H. Fred Lange Ziegel quoted Von Pirquet as saying in an article on "Allergy" recently published: "I personally feel quite sure that it will be possible to make the diagnosis of syphilis by means of cutaneous inoculation as soon as the syphilis virus can be obtained in pure culture." Then Dr. Noguchi had come along, had found a way of growing the treponema in pure culture and had enabled Von Pirquet's prophecy to be fulfilled. Dr. Ziegel compared the results which Dr. Cohen had obtained with luetin injected intradermatically in non-syphilitic individuals with the results which were ordinarily obtained when old tuberculin was injected into the skin of apparently non-tuberculous adults. He said that in adults the Von Pirquet reaction was of little practical value for the reason that so many individuals had been previously sensitized by some tuberculous infection, and that more than fifty per cent. of apparently non-tuberculous adults gave a positive Von Pirquet test. In striking contrast to this result was Dr. Cohen's report that in fifty patients regarded clinically and serologically as non-syphilitic, forty-seven of the luetin test were absolutely negative, and three were mild and atypical responses easily distinguishable from positive reactions. Even if the luetin test proved to be only of negative value, Dr. Ziegel regarded this new procedure as important and likely to have far-reaching consequences in the diagnosis of syphilis in the future.

Dr. Boleslaw Lapowski said that he had first to be convinced that the spirochæta pallida is the cause of syphilis, before he would attach much significance to the results obtained with the new cutaneous reaction. He thought that the procedure was not without danger.

Dr. John E. Weeks said that he believed firmly in laboratory aids to diagnosis and that studies such as the present one should be encouraged.

Dr. Chas. E. Atwood said it was noteworthy that the cutaneous luetin test was often positive in cases in which the Wassermann test was negative, presumably because of recent antisyphilitic treatment.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE THIRD AND FOURTH QUARTERS OF THE YEAR 1910.

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Edited and Translated by Dr. MATTHIAS LANCKTON FOSTER.

Sections VIII.–XII. Reviewed by Dr. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

251. KUHNT. **The cure of organic ectropion of the lower lid.** *Zeitschrift f. Augenheilkunde*, xxiv., 2., p. 151.

252. MEISNER, W. **Plastic operation on the lid with a flap of skin and cartilage.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., ii., 1, p. 1.

253. HESSE, R. **Adenoma of the Meibomian glands.** *Ibid.*, 2, p. 145.

254. POLLITZER, S. **The nature of eyelid xanthoma.** *Journal of Cutaneous Diseases*, Nov., 1910.

KUHNT (251, **The cure of organic ectropion of the lower lid**) uses two methods for the cure of ectropium trachomatosum of the lower lid. In the milder cases he employs a modification of Ammon's tarsotomia longitudinalis, a tarsotomy, and an excision of a wedge-shaped piece of the tarsus proportioned to the degree of the inversion; in worse cases, an excision of the tarsus similar to that practiced on the upper lid. The margin of the lid is then turned outward by sutures. The technique is simple and the results good. K.

MEISNER (252, **Plastic operation on the lid with a flap of skin and cartilage**), after extirpation of a carcinoma of the lower lid, covered the defect in the manner suggested by Elter and Has-Mueller. A wedge of the proper size was cut from the helix of an ear so that the cartilage was covered with skin on both sides. The flap was placed in position so that the anterior surface was turned toward the eyeball and the margins were sutured to both the conjunctiva and the skin. The flap healed in well and there was little contraction. Recurrence gave an opportunity for a subsequent histological examination of the flap, which showed that the cartilage had healed smoothly everywhere, but cartilage was normally present only in places covered with perichondrium, elsewhere it had undergone degenerative and resorptive changes and had been replaced by connective tissue in some places. K.

HESSE (253, **Adenoma of the Meibomian glands**) removed from the upper lid of a woman, 64 years old, a tumor as large as the lid, which proved under the microscope to be an adenoma that had originated from the Meibomian glands. An interesting point is that the microscopic examination showed an indubitable transformation of the tissue elements from benign to malignant. Like all primary tumors of the Meibomian glands, adenoma is rare.

Xanthoma palpebrarum, according to POLLITZER (254, **The nature of eyelid xanthoma**), is in no way related to xanthoma tuberosa, but is the product of a peculiar fatty degeneration of muscle fibres which occurs in the eyelid on account of the unusual arrangement of the fibres. It does not belong to the neoplasms, but is a degeneration like colloid degeneration of the skin.

ALLING.

IX.—LACHRYMAL ORGANS.

255. JONES, L. W.. **Congenital dislocation of the lachrymal gland.** *Ophthalmology*, Oct., 1910.

256. TERLINCK, H. **A case of congenital fistula of the lachrymal gland.** *Zeitschrift f. Augenheilkunde*, xxiv., 6, p. 522.

257. FOSTER, J. **Congenital blennorrhœa of the lachrymal sac.** *Ophthalmic Review.*

258. CORNER, S. G. **Congenital blennorrhœa of the lachrymal sac.** *Lancet*, 1910, vol. i., p. 26.

259. NUEL. **Extirpation of the lachrymal sac.** *Scalpel*, 1909.

260. CHARLES, J. W. **A modification of the scissors operation for slitting the lower canaliculus.** *Annals of Ophthalmology*, July, 1910.

261. LURIE, O. R. **Etiology of cysts of the lachrymal sac.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., ii., 4, p. 374.

262. JACK, E. E. **New growths of the lachrymal glands. A case. Death.** *Transactions of the American Ophthalmological Society*, 1910.

JONES (255, **Congenital dislocation of the lachrymal gland**) found the lachrymal gland in the left eye dislocated under the bulbar conjunctiva. It could be replaced. These cases are occasionally observed. ALLING.

TERLINCK (256, **A case of congenital fistula of the lachrymal gland**) describes a very rare case of congenital fistula of the lachrymal gland met with in a boy 4 years old. The opening of the fistula was surrounded by fine hairs and was situated at the extreme temporal side of the upper lid 8*mm* from its margin. The escape of the lachrymal secretion from it was very small normally, but increased greatly when the child cried or when the lid was everted. The fistula ran about 6*mm* into the orbit. Under general anæsthesia the fistula was excised to the margin of the tarsus and the remains sutured to an opening in the fornix. Healing took place in a short time and then a new fistula appeared at the outer canthus. The palpebral gland, which was about the size of a small pea, and occupied its proper place, had no connection with the orbital gland. Terlinck thinks it certain that the orbital gland discharged its secretion through the fistula, while the palpebral emptied into the conjunctival sac. Microscopically the wall of the canal consisted of cutaneous tissue of varying thickness, with hair papillæ and typical sweat glands; the thickness of the wall and the number of hair follicles decreased toward the orbit, but the histological character remained the same.

FOSTER (257, **Congenital blennorrhœa of the lachrymal sac**). The author finds that expression thoroughly performed will generally effect a cure in these cases, and that it is unnecessary to slit up the canaliculus and pass a probe. Reference is made to Mayou's paper (*Reports of Royal London Oph. Hosp.*, 1908). T. HARRISON BUTLER.

CORNER (258, **Congenital blennorrhœa of the lachrymal sac**)

reports the case of a female child who was noticed at birth to have a swelling over each sac. The swellings much increased by the third day and the skin over became purplish; there was regurgitation of muco-purulent fluid from the left sac especially. An incision was made on the left side and the condition subsided, whilst the right was treated by pressure downwards in the direction of the nasal duct, and bathings; the result was quite satisfactory. There appears to have been no definite obstruction in the nasal ducts in this patient, and the condition was probably due to accumulation of debris.

PAYAN DAWNEY.

NUEL (259, **Extirpation of the lachrymal sac**) recommends extirpation of the sac as the only operation that is satisfactory to both the physician and the patient. It is particularly to be recommended as a measure of prophylaxis among workmen who are liable to injuries of the cornea. DANIS.

CHARLES (260, **A modification of the scissors operation for slitting the lower canaliculus**) suggests an improvement over the operation of Greene, who opened with the scissors the beginning of the canaliculus inward from the lid margin, by snipping off the triangular flap thus formed and producing an artificial lacus lacrimalis around the punctum.

ALLING.

LURIE (261, **Etiology of cysts of the lachrymal sac**) gives an interesting description of the anatomy of a cyst of the lachrymal sac. He found in its wall, after extirpation of the sac, together with a tubular glandular duct, a large diverticulum that extended the entire length of the wall with a lumen that was microscopically visible. The inflammatory changes in the mucous membrane of the diverticulum were very slightly marked, either in its epithelium or its connective tissue. The etiology of the cyst is not clear. Lurie believes that it came not only from the glands in the wall of the sac, but also from a diverticulum that had been constricted off. There is very little literature as yet concerning cysts of the lachrymal sac.

JACK (262, **New growths of the lachrymal glands**) points out the fact that tumors of the lachrymal gland are usually of a mixed variety, often containing cartilaginous, hyaline, and myxomatous tissue, being similar to tumors of the salivary

glands. They are very rare and although variously named have generally been regarded as endotheliomata. They are malignant in nature. His case died after two recurrences following extensive operations. Verhoeff, who made the pathological examination, gives the diagnosis as congenital epithelial tumor with recurrence locally. ALLING.

X.—ORBITS AND ACCESSORY SINUSES.

263. COULTER and COATS. **Teratoma of the orbit.** *Royal London Ophthalmic Hospital Reports*, Jan., 1910.

264. ELLIOTT, R. H., and INGRAM, A. C. **A case of teratoma of the orbit.** *Ophthalmoscope*, Dec., 1910.

265. CLAIBORNE, J. H. **Cylindroma of the orbit.** *Trans. Amer. Ophthalm. Soc.*, 1910

266. QUACKENBOSS. **Tumor of the adrenal gland with metastases in the orbit.** *Trans. Amer. Ophthalmol. Soc.*, 1910.

267. RICHTER, P. V. **Intraorbital hemorrhage in intermittent exophthalmos.** *Muenchener med. Wochenschrift*, No. 52, 1910.

268. BECKER, H. M. **Orbital œdema with proptosis resulting from auto-intoxication. A case.** *Ophthalmology*, Oct., 1910.

269. LURIE, O. R. **Two cases of tenonitis.** *Zentralbl. f. prakt. Augenheilkunde*, xxxiv., Nos. 11 and 12.

270. FEJER, JUL. **A case of retrobulbar inflammation caused by a foreign body.** *Zentralbl. f. prakt. Augenheilk.*, xxxiv., No. 8.

271. CALDERARO. **Operation for exenteration of the orbit with preservation of the eyeball.** *La Clinica Oculistica*, Oct. and Nov., 1909.

272. SWEET, W. M. **Implantation of a metal ball in Tenon's capsule (the Frost operation) with report of 48 cases.** *Trans. Amer. Ophthalmol. Soc.*, 1910.

273. GROENHOLM. **Enophthalmos traumaticus.** *Zeitschrift. f. Augenheilk.*, xxiv., 6, p. 479.

274. DE SCHWEINITZ, G. E. **Some observations on the ocular manifestations of sinus disease.** *Trans. Amer. Ophthalmol. Soc.*, 1910.

275. OERTEL. **Ocular migraine and sinus disease.** *Berliner klin. Wochenschrift.*, 1910, p. 1136.

276. FULLERTON, ROBERT. **On mucocele of the nasal sinuses and its complication by optic neuritis.** *British Medical Journal*, 1910, i., p. 917.

277. WOOD, C. G. RUSS, and WALLIS, G. F. C. **A case of bilateral papillœdema and ring scotoma due to sphenoidal sinusitis.** *Lancet*, 1910, ii., p. 937.

COULTER and COATS (263, **Teratoma of the orbit**) record a case of true teratoma of the orbit, a condition which is very rare (no case has been recorded in English literature for the past twenty-five years) and of considerable ophthalmological and pathological interest.

The patient was noticed at birth to have the left eye pushed forwards out of the orbit by a tense soft tumor, and in the course of three days the cornea commenced to slough from exposure. An attempt was made to unite the lids by a complete tarsorraphy after aspirating the tumor, but the stitches cut out and the eye was lost from panophthalmitis. When 18 days old the infant died of exhaustion, and a partial post-mortem was made, when the contents of the orbit were removed and fixed in formalin. The specimen was an egg-shaped lobulated tumor, 2.5 x 2.2. x 2.2*cm*, firmly adherent to the remains of the eye at its anterior end, but sharply marked off from the sclera, which was intact, and traversed by the optic nerve, which was slightly bowed downwards but not invaded. On dividing it in an antero-posterior direction the most noteworthy features were a number of plaques of hyaline cartilage and numerous cysts of varying size, some of them multilocular. On microscopical examination the tumor was found to consist of a jumble of the following tissues derived from all three germinal layers: 1. Connective tissue not embryonal in type. (*a*) Somewhat cellular fibrous tissue containing well formed vessels and nerves and forming the groundwork of the tumor. (*b*) Adipose tissue, in islands among the fibrous tissue, fully formed in some places, but in others more cellular than usual. [Probably (*a*) and (*b*) are not proper to the tumor, but represent the original tissues of the orbit.] (*c*) Lymphoid tissue in isolated nodules. (*d*) Hyaline cartilage in large areas, both vascular and avascular, surrounded by perichondrium, with the matrix calcified in places and several patches of true ossification in cartilage. (*e*) Bone both in the cartilage and in an isolated tube, with thick periosteum and well developed vascular eosinophile cells. (2) Skin. (3) Brain substances covered in parts with a single layer of vertical cells probably representing the ependyma of the ventricles. (4) Intestine, not merely mucous membrane, but with the whole thickness of the intestinal wall represented. (5) An internal gland, probably fœtal liver, possibly suprarenal or thyreoid. (6) Respiratory mucous membrane, agreeing in its general characters with (*a*) that of the upper air passages, especially the trachea, and (*b*) the nasal respiratory mucous membrane. (7) Other

types of cysts: (*a*) lined with stratified epithelium comparable with that of the conjunctiva, etc.; (*b*) lined with single layer of flattened cubical cells; (*c*) lined partly with stratified incompletely ciliated epithelium, partly with a single row of mucous cells.

These tissues were massed together in inextricable confusion and the tumor had no proper delineating capsule but passed off indefinitely into the surrounding orbital tissue.

After giving a resumé of eight other recorded cases of orbital teratoma and referring to several instances of other similar conditions, the authors discuss the hypotheses which have been suggested to account for these tumors by parthogenesis, impregnation of polar globules, segmentation of the blastomeres, and inclusion of one impregnated germ in another, and finally express the opinion that the tumor originated at a very early period of intra-uterine life, by the segregation of certain cells of the developing embryo which subsequently took on independent growth. T. HARRISON BUTLER.

ELLIOTT (264, **Teratoma of orbit**). A Hindoo child with an enormous growth about the size of an orange, in the place of the left eye. It was removed, shelling out easily, and leaving a pedicle behind at the apex of the orbit. The orbit closed in nicely and the after-course was uneventful. The condition is shown by photographs taken before and after operation. T. HARRISON BUTLER.

The tumor removed by CLAIBORNE (265, **Cylindroma of the orbit**) was growing from the roof of the orbit and extended to the apex. It was removed through an incision in the eyebrow. The eye movements are now perfect although there is complete ptosis and anæsthesia of the outer side of the brow over the area of the temporal branches of the supraorbital. He suggests as a substitute for the Kroenlein operation the removal of an elliptic piece of bone from the upper-outer edge of the orbit, thinking that the bone would re-form if the periosteum is replaced. ALLING.

The case of QUACKENBOSS (266, **Tumor of the adrenal gland with metastases in the orbit**) belongs to the so-called Hutchinson class of tumors of the adrenal gland with metastases in the skull. They are usually found in young children and show ecchymosis of the eyelids and a rapidly developing

exophthalmos with a growth in the orbit. There is general glandular enlargement, with a tumor in the region of the kidney. The pathological diagnosis by Verhoeff was metastatic neuroma malignum of the malar bone and orbit, probably from a primary tumor in the adrenal gland. The growth apparently arose from embryonic nerve cells of the gland and was formerly regarded as a sarcoma. When the appearances are those of glioma the diagnosis is easily overlooked. ALLING.

RICHTER'S (267, **Intraorbital hemorrhage in intermittent exophthalmos**) patient was a young woman, 20 years old, who had had a moderate intermittent exophthalmos for about a year, when she had more considerable exophthalmos with suggillations of both lids. The movements of the eyeball were limited and painful, the ophthalmoscopic condition and the vision were normal, but for four days she had suffered from extremely severe headache with a tendency to vomit. No other organs were affected. At the end of three days the expected menses appeared, the condition began to retrogress and had passed away by the tenth day. Apparently a varix had ruptured in the orbit.

After a severe attack of auto-intoxication, the nine-year-old patient of BECKER (268, **Orbital œdema, with proptosis from auto-intoxication**) developed a proptosis of the left eye. The globe was fixed, did not pulsate, and was not painful. Treatment with ice compresses, intestinal antiseptics, and potassium iodide resulted after several weeks in the restoration of the eyeball to its normal position and vision. In the absence of other cause the author considers the condition due to toxæmia. Involvement of the sinuses seems to have been excluded. ALLING.

LURIE'S (269, **Two cases of tenonitis**) first case was one of subacute serous tenonitis. The only symptoms were a brick-red injection of the conjunctiva bulbi and a pale yellow chemosis, with reduced vision, probably due to a slight œdema of the chorioid without any ophthalmoscopic change. There was no pain, no restriction of the movements of the eye, no exophthalmos, and no general disturbance. Salicylic acid and iodine were of service. Some months later it was learned that an infection of syphilis had shortly preceded the trouble. The second case was one of a severe attack that set in some

days after an influenza with œdema of the tarsal portion of the upper lid, without involvement of the conjunctiva bulbi, but with a slight degree of protrusion, severe pain when the eye was moved, and great impairment of vision, caused by a chorioidal exudate at the posterior pole. This increased rapidly; the chemosis, tension, and fever grew worse, and led in a week to panophthalmitis. Finally the pus broke through the sclera into the external rectus, which was followed by an improvement of the general condition, but phthisis of the eye.

A piece of a pen-holder 16*mm* long was left behind in the injury of the orbit described by FEJER (270, **A case of retrobulbar inflammation caused by a foreign body**) and eluded several searches made to find it. Exophthalmos, optic neuritis, chemosis, and fever were caused; the orbit and accessory sinuses were opened up, and finally the foreign body was discovered. Paralysis of the muscles and some exophthalmos continued to exist, due to retrobulbar cicatrices, but these were dissolved by injections of fibrolysin.

Kroenlein's operation and its modifications always furnish a narrow aperture when an orbital tumor 3*cm* in diameter is to be removed, or when the entire retrobulbar tissue is to be removed. In order to be able not to forego the preservation of the eyeball in such cases, CALDERARO (271, **Operation for exenteration of the orbit with preservation of the eyeball**) has devised an operation by means of which exenteration can be performed as easily and thoroughly as in the ordinary manner and yet the eyeball be saved. The operation consists of the formation of a large flap composed of both lids with the conjunctival sac and the eyeball separated from its muscles and the optic nerve. By turning back this flap the cavity of the orbit is exposed and can be exenterated perfectly. The flap is then replaced in position. Healing takes place readily, as a rule, the eyball being in a condition of enophthalmos, but not sunken in. When the eyeball is kept in this manner the further development of the orbit is not hindered in children and adolescents. SPECIALE CIRINCIONE.

SWEET (272, **Implantation of a metal ball in Tenon's capsule**) sees no contra-indication to the operation except malignant growth and phthisis bulbi. He does not believe that

sympathetic ophthalmia is caused by the presence of the foreign body. Platinum balls were used in six cases, gold in the other forty-two. He prefers the former. In four the ball was expelled by the giving way of the sutures, but two were successfully replaced. ALLING.

GROENHOLM (273, **Enophthalmos traumaticus**) critically reviews our knowledge in regard to this rare disease, basing his remarks on two cases of his own and others collated from literature. The factors that produce traumatic enophthalmos are usually combined. The ordinary cause is fracture with enlargement of the cavity of the orbit. Cicatrization and atrophy of the orbital tissue after lacerations, as well as retrobulbar hemorrhages, have been observed as factors. Trophic disturbances after trauma may also bring about an enophthalmos. Groenholm believes it probable that enophthalmos may also be produced by laceration of the fascia that fixes the eyeball in position, or by a lesion of Landstrom's smooth muscles in the orbit. At present ninety-six cases of enophthalmos traumaticus are known. K.

DE SCHWEINITZ (274, **Some observations on the ocular manifestations of sinus disease**) calls attention to three conditions in which sinus disease is sometimes overlooked as the cause. (1) Recurrent ecchymosis and œdema of the eyelid. The forms to which he refers differ from the œdema seen in acute sinus disease in that it appears in attacks and is often diagnosed as angeio-neurotic œdema. He believes that in some cases it may have a nasal origin. (2) Fugitive episcleral congestion. In casting about for a cause he thinks that it would be well to investigate the nose. (3) Some unusual forms of scotomas. Under this head he relates the case of a young woman who suffered from fugacious scleral congestion, accompanied by intense headache and presenting a ring-shaped scotoma in the left field and a wedge-shaped one in the right, followed by a paracentral scotoma, characteristic of a lesion of the macular fibres in the dorsal aspect of the chiasm. She had sphenoidal disease and was relieved by treatment.

ALLING.

OERTEL'S (275, **Ocular migraine and sinus disease**) patient, a strong young man, 19 years old, of a healthy family, had for five years had severe attacks of frontal pain, increasing in

frequency, during which the right eye was greatly injected and markedly photophobic. The right supraorbital nerve was very sensitive to pressure and there was a moderate degree of coryza during the attacks. The headache gradually spread to the left brow and the attacks caused a condition of bodily weakness. No fever was present at any time. Pus was detected coming from the frontal sinus during the attack and the condition was cured by operation.

FULLERTON (276, **On mucocele of the nasal sinuses, and its complication by optic neuritis**) reports two cases of non-suppurative mucocele, the one of right ethmoidal region, the other of the left frontal sinus. In the former there was a history of three years' headache, and then forward, outward, and downward displacement of the right eye with right optic neuritis. A cystic swelling in the upper part of the right nasal passage was incised and drained of a sterile viscid fluid. The neuritis and displacement subsequently disappeared. In the latter there was similar ocular displacement with a resistent swelling from the lower internal angle of the orbit to the supraorbital notch. In the upper part of the left nasal passage there was a bulging from which on incision serous and mucoid fluid escaped, and a probe could be passed into the frontal sinus. A. H. PAYAN DAWNAY.

WOOD and WALLIS (277, **A case of bilateral papillœdema and ring scotoma due to sphenoidal sinusitis**) report the following case. The patient was a female, aged 29 years, of previously good health, who for two years had suffered from severe frontal headache with short remissions, which then suddenly ceased. Some nine months before this cessation she noticed defective sight in the left eye, reduced during the next six months to perception of light only. The right eye now failed suddenly, but recovered in five weeks, to be followed by a more serious relapse; vision again improved, but remained misty for the next ten months, when she first attended the hospital. Her condition was as follows: R.V. = $\frac{6}{9}$, L.V. = hand movements; left concomitant divergence, no affection of convergence, much œdema of both disks, no hemorrhages. After twelve days' modified Burnham treatment, R. V. = $\frac{6}{9}$, L. V. = $\frac{6}{18}$, and there was a reduction in the neuritis. She now had an attack of frontal headache, lasting a fortnight; vision

was again affected, R. V. = $\frac{6}{9}$, L. V. = p. l. in temporal field only; there was tenderness on backward pressure of the globes, the pupils were equal and active directly and indirectly, Wernicke's hemianopic reflex being obtainable in the left; media were clear; both disks were swollen, right + 3 D., left + 4 D.; arteries were threadlike, veins engorged, retinæ lightly œdematous, but no hemorrhages. Fields: R. much contracted for white and colors; L. a small island of vision in temporal half. In the nose the turbinates were congested and pus seen on the middle ones posteriorly; the antrum and frontal sinus were translucent. The Burnham treatment was repeated for a few days and then the middle turbinals were removed, and the sphenoidal sinuses were subsequently opened; a fortnight later the vision had improved, R. V. = $\frac{6}{6}$, L. V. = $\frac{6}{12}$. Three months later there was still a little pus posteriorly in the nose, the optic disks were slightly blurred, there was no atrophy or exudate, but in the intermediate zone of the retinæ some grainlike patches of pigment; the right field had increased downwards, and the left showed a complete annular scotoma with a relative scotoma for green. R. V. = $\frac{6}{6}$, L. V. = $\frac{6}{9}$. After another month the patient was much better, the visual fields were more extensive, the left scotoma for green had gone, and the ring scotoma was not so wide. The authors consider a history of sudden blindness with frontal headache in a previously healthy person with occasional remissions as strongly suggestive of sinus disease, and that closed empyemata are more likely to cause neuritis than a merely intense sinus inflammation. That the ring scotoma is not due to retinitis pigmentosa is shown by the absence of other signs and the marked improvement under treatment.

PAYAN DAWNAY.

XI.—CONJUNCTIVA.

278. CALDERARO. **Bacteriology of the conjunctiva after extirpation of the lachrymal sac.** *La Clinica Oculistica*, Aug. and Sept., 1909.

279. MAYOU, S. **The bacteriology of the normal conjunctiva in its relation to intraocular operations.** *Ophthalmoscope*, Sept., 1910.

280. DOYNE, R. W. **Observations on conjunctivitis.** *Lancet*, 1910, i., p. 1674.

281. BUTLER, T. H. **A case of Widmark's conjunctivitis.** *Ophthalmoscope*, Nov., 1910.

282. PARKER, W. R. **Ophthalmia nodosa, or caterpillar hair ophthalmia.** *Jour. Amer. Med. Assoc.*, Aug. 20, 1910.

283. LEBER, A., and v. PROWAZEK, S. **A new infectious conjunctivitis. (Epitheliosis desquamativa conjunctivæ.)** *Berl. klin. Woch.*, 1910, p. 2386.

284. MCKEE, H. **On trachoma bodies.** *Ophthalmoscope*, May, 1910.

285. WOLFRUM. **Inclusion diseases of the human conjunctiva.** *Report of the Thirty-sixth Meeting of the Ophthalmological Society of Heidelberg.*

286. COLLINS, C. T. **Diseases of the lymphoid tissue of the conjunctiva.** *The Royal London Ophthalmic Hospital Reports*, Jan., 1910.

287. LANDOLT, G. and F. **A case of pemphigus cured.** *Arch. d' ophtalmologie*, XXX., p. 337.

288. GIFFORD, H. **Sporotrichosis of the eyeball and eyelids.** *Ophthal. Record*, Nov., 1910.

289. MEYER-WALDECK, F. **An operation for pterygium.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., ii., 4, p. 381.

CALDERARO (278, **Bacteriology of the conjunctiva after extirpation of the lachrymal sac**) investigated the microbic condition of the conjunctivæ, and determined the degree of virulence of the isolated germs, in ten individuals with chronic catarrhal or purulent dacryocystitis, eight of whom had healthy conjunctivæ and two cicatricial trachoma. He repeated the same investigations at various intervals after the extirpation of the sac, both after the eye had been bandaged and after it had been left uncovered, and came to the following conclusions: The number of microbes in the conjunctiva is always lessened after the extirpation of the diseased sac, but the diminution varies considerably according as the examination is made a few days or several months after the extirpation. At the end of ten or fifteen days the following may be noted: (*a*) A considerable numerical decrease of the bacteria. The pathogenic micro-organisms are still present, but reduced both in number and in virulence. (*b*) Cultures taken from a conjunctiva that has been bandaged remain sterile only a few hours (3 to 6), because the micro-organisms proliferate again very soon in the conjunctival secretion confined beneath the bandage, and their virulence usually increases. From this the clinical conclusion is to be drawn that no operation should be performed on the eyeball in less than at least fifteen days after the extirpation of the sac. Two months after the extirpation of the lachrymal sac a pathogenic micro-organism

(diplococcus) was found in only one of five cases; on the other hand, saprophytes are apt to be abundant, especially Reymond's bacillus. Under a dressing, on the other hand, the pathogenic germs reappeared in all cases, and though their virulence was insufficient to kill the animals experimented on they were able to interfere with the proper healing of a corneal wound. The results after three, four, five, and six months were markedly similar to those obtained at the end of two months, so it may be supposed that after the second month from the extirpation of the sac the saprophytic forms predominate and pathogenic forms are rarely met with, which are almost without virulence both for animals and for the cornea. But when the eye is bandaged the pathogenic germs return within six hours in almost a third of the cases, win the upper hand in twelve hours, and, what is worst, increase in virulence for the eye. The saprophytic germs decrease in number at the same time. If the conjunctiva is trachomatous, the appearance and increase of the pathogenic germs are earlier. Danger of post-operative infection is less after extirpation of the lachrymal sac than after division of strictures and probing, but when it is necessary to perform such an operation as for cataract much time should be allowed to elapse, and then no dressing should be applied, but the conjunctival sac should be washed out *ter in die* with a sterile physiological solution, as this suffices to keep the conjunctiva sufficiently aseptic.

SPECIALE CIRINCIONE.

MAYOU (279, **The bacteriology of normal conjunctiva in its relation to intraocular operations**). The two common organisms are the staphylococcus albus and bacillus xerosis. These are found in from 80% to 90%. The albus is the most frequent cause of ocular infection after operation. The view expressed by Axenfeld that albus is innocuous is untenable. The pneumococcus and diplobacillus occur in 8% of cases. Subtilis often causes hypopyon ulcer and suppuration in the eye. T. HARRISON BUTLER.

DOYNE (280, **Observations on conjunctivitis**) treats of conjunctivitis from the point of view of bacterial origin. With regard to gonorrhœal ophthalmia he expresses doubt as to its occurrence by metastasis, and believes the "keynote of treatment is cleanliness and masterly inactivity," with occa-

sional instillation of argyrol and, if the swelling of the lids be great, division of the external canthus. He draws attention to cases of staphylococcus aureus infection of the Meibomian glands with conjunctivitis, in which he has obtained cure by the use of a vaccine prepared from the micro-organisms obtained from the infected glands. Among forms of conjunctivitis due to other causes he mentions a rare form due to intolerance of certain flowers, namely primulas and dahlias; the skin of the face is also affected, resembling erysipelas.

PAYAN DAWNAY.

BUTLER (281, **A case of Widmark's conjunctivitis**). This disease was described by Widmark in the *Mitteilung aus der Augenklinik der Carolinischen Instituts zu Stockholm* for 1910. The changes are confined to the lower lid and to the ocular conjunctiva under the cornea. Simple inspection does not show any marked change, but the whole area stains with fluorescin. The cornea in its lower quadrant is occasionally stippled. Yellow ointment is the best remedy. The author describes a typical case which occurred in his practice.

T. HARRISON BUTLER.

PARKER (282, **Ophthalmia nodosa**) has collected and tabulated the thirty-eight reported cases of this well-known but rare affection. In his patient an attack of swelling, pain, and irritation occurred after having burned off the caterpillars from an apple-tree. The acute symptoms subsided but left a chronic inflammation of the conjunctiva with five areas of inflammation in the superficial layers of the cornea. These were scraped and small hairs removed, when recovery ensued. The caterpillar was the Bombyx rubi. ALLING.

LEBER and PROWAZEK (283, **A new infectious conjunctivitis**) have studied in Samoa an infectious conjunctivitis which resembles trachoma in its early stages, pemphigus in its later, and results in cicatrization and atrophy of the conjunctiva, corneal ulcers, trichiasis, and entropion. In the very early stages the palpebral conjunctiva appears to be diffusely thickened, smooth, and lustrous, with a thin, slightly milky secretion, which is extremely rich in epithelial cells. Twice they found the primary infection to be a circumscribed focus, as large as a lentil, yellowish gray, which rose above the surrounding conjunctiva. Inclusions are also found in the

early stage, which the authors consider to be chlamydozoa and, like those of trachoma, to be described as initial bodies, residue bodies, and elementary bodies. Recent infections they found to be influenced favorably by instillations of pyoctanin, 1 : 1000 to 1 : 100. The 1% solution is not always well borne, especially when fresh ulcers are present. Zinc sulphate had no marked effect. The authors recommend 6% kali chloricum and tinctura opii crocata as astringents after the inflammation has subsided. Hygienic measures should be adopted to combat the disease.

McKee (284. **Trachoma bodies**). After passing in review the history of these bodies the author states that he found them in seven cases out of eight examined. He thinks their discovery will be an aid in diagnosis. The microphotographs show as little or as much as such photographs usually do. The beautiful colored drawings which accompany most German papers on these subjects are much more illuminating.

T. Harrison Butler.

Wolfrum (285, **Inclusive diseases of the human conjunctiva**) studied the pathology of the inclusion blennorrhœa of infants in comparison with gonococcal blennorrhœa and trachoma. The inclusions are exactly like those found in trachoma. The pathological picture of gonococcal blennorrhœa is marked by a considerable œdema of the epithelium and connective tissue, and papillary formations appear early. The condition in inclusion blennorrhœa is essentially different. The epithelium exhibits a fibrinous and cellular coat and is completely destroyed over large areas. Where the epithelium is preserved we find many inclusions in the cells. The subepithelial infiltration contrasts with that of gonococcal blennorrhœa by consisting pre-eminently of plasma cells. In the later stages irregularities are formed in the infiltration and formation of epithelium that are macroscopically visible. The picture is then very similar to that of trachoma in adults, except for the absence of follicles. In Wolfrum's opinion the conjunctiva of infants is very insusceptible to the formation of follicles, even under pathological conditions; yet he observed distinct follicles, with inclusions altogether absent, in two cases. True trachoma developed in his transmission experiments. K.

Collins (286, **Diseases of the lymphatic tissue of the**

conjunctiva) deals almost entirely with trachoma, a subject its author is well qualified to speak on, having for the past five years been Ophthalmic Surgeon to the Ophthalmia Schools of the London Asylum Board to which children suffering from contagious eye disease are admitted.

Two interesting cases are cited in which trachoma was clearly inoculated from one individual to another. The early symptoms were similar to those of acute muco-purulent ophthalmia. There were swelling and redness of both ocular and palpebral conjunctiva, some papillary enlargement of the latter, and discharge. Not until the congestion of the conjunctiva had somewhat subsided did the typical follicles appear. In one case a child was caught taking discharge from another child's eye who was suffering from trachoma and putting it into her own. A muco-purulent conjunctivitis set in and two months later follicles appeared. Collins considers that gray, scattered, avascular spots, rather smaller than a pin's head, in the tarsal conjunctiva of the upper lid were quite as early a symptom as the presence of follicular enlargements in the upper retrotarsal fold. The nature of the contagion is considered. It is certainly not spread through the air for if a few simple precautions are adopted, nurses and others attending trachoma cases do not contract the disease. The organism is probably located in the fibro-adenoid layer. The trachoma follicle can be compared with a tubercle nodule. Trachoma is an essentially chronic disease; the acute symptoms which usher in an attack can be accounted for by a mixed infection. Collins does not think it correct to speak of a papillary form and a follicular type. The essential element is the follicle. Here he follows the German dictum "kein Trachom ohne Kornchen," but Fuchs describes three forms, a papillary, a follicular, and a mixed. After four years' ophthalmic work in the Ophthalmic Hospital in Jerusalem we convinced ourselves that this classification is correct. There is a large class of severe trachoma characterized by excessive overgrowth of the papillæ in which no naked-eye follicles can be seen even in the retrotarsal folds. Collins thinks that trachoma can be cured without the formation of fibrous tissue; he suggests that sclerosis would better express the condition which usually follows trachoma rather than

cicatrization. Grady's forceps are better than Knapp's rollers. We would add that Cropper's modification of Grady's forceps is better still. Cropper, finding that the free point of Grady's forceps was apt to catch in the tumefied tisssue, has continued the free end till it joins the shank, again forming a large oval. Collins approves of excision of the retrotarsal folds, an operation now condemned by many operators, but has so far never had a case sufficiently severe to justify Kuhnt's excision of the tarsus. Sulphate of copper is still the best local application. Kataphoresis of copper sulphate is not more efficacious than simple application. Some cases have done well after treatment with X-rays, but the effect of radium has not been encouraging.

Whenever we read a paper on trachoma written from the results of European experience, we always feel that a first-class ophthalmic pathologist who spent a summer in Palestine might unravel many of the problems which still surround the disease. The question of v. Prowazek's cell inclusions could be solved there or in Egypt. Trachoma in the East and at home are as different in severity as are gonorrhœal and Koch-Weeks's conjunctivitis. T. HARRISON BUTLER.

E. and F. LANDOLT (287, **A case of pemphigus cured**) cured a case of pemphigus of the conjunctiva in a man 41 years old by excising the diseased place and implanting skin taken from a region comparatively far removed from the disease.

BERGER.

GIFFORD (288, **Sporotrichosis of the eyeball and eyelids**) has added one to the eighty cases of this affection first described by Schenck in 1898. It has been known to attack the skin and conjunctiva of the lid, but this is the first case in which the bulbar conjunctiva has been the seat of the disease. It occurs in a variety of forms, but most commonly shows nodules in the skin which break down into abscesses, with secondary infections along the lines of the lymphatics.

The germs of the sporotrichosis can only exceptionally be found in the pus but can be grown on the proper media. His case presented a nodular crescentic growth of the bulbar conjunctiva, extending around the lower circumference of the cornea, being about ¼ in. across at its broadest place.

Cultures made from one of the nodules showed the characteristic growth.

Under treatment with potassium iodide there was marked improvement, but the patient passed from observation. He relates five other cases which he thinks were of the same nature.

ALLING.

MEYER-WALDECK'S (289, **An operation for pterygium**) operation is a modification of Holt's, who applies a Thiersch graft at the margin of the cornea after removal of the pterygium. Meyer-Waldeck diminishes the raw surface left by the abscission of the pterygium by drawing the edges of the wound closer together by means of sutures and then covers the remaining defect with a conjunctival flap, sutured in position. If no subconjunctival tissue is transplanted with them the flaps always adhere well. No recurrence has yet been observed after this operation. K.

XII.—CORNEA, SCLERA, ANTERIOR CHAMBER.

290. HOLLOWAY, T. B. **Congenital pigmentation of the cornea.** *Trans. Amer. Ophthalm. Soc.*, 1910.

291. FRANKE, E. **A peculiar form of superficial keratitis.** *Report of the Thirty-sixth Meeting of the Heidelberg Ophthalm. Soc.*, 1910, p. 133.

292. FUCHS, E. **Dystrophia epithelialis corneæ.** *Arch. f. Ophthalm.*, lxxvi., 3, p. 478.

293. STEPHENSON, S. **On sloughing cornea in infants: An Account based upon the records of twenty-one cases.** *Ophthalmoscope*, Nov., 1910.

294. OHM, JOHN. **Ribbon-shaped corneal opacity in a nine-year-old girl, and its treatment with subconjunctival injections of iodide of potassium.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., ii., 2, p. 243.

295. MOHR, TH. **Keratitis parenchymatosa following trauma.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., ii., 6, p. 611.

296. MORANO. **Clinical contribution to the study of ocular diseases due to malaria.** *Annali di Ottalmologia*, 1909, fasc. 11 and 12.

297. MORAX. **Mycosis of the cornea caused by the verticillium graphii.** *Annal. d'oculistique*, cxliv., pp. 323–335.

298. DICKSON, T. A. **The operation of pannus dissection.** *Ophthalmic Record*, Aug., 1910.

299. KUHNT. **Operative treatment of partial staphyloma.** *Zeitschrift f. Augenheilkunde*, xxiv., 6, p. 516.

300. WOOD, R. J., and WEBB, L. **A dermoid growth of the cornea in a dog.** *Ophthalmoscope*, Sept., 1910.

301. VEASEY, C. A. **Report of a case of epibulbar sarcoma.** *Trans. Amer. Ophthalmol. Soc.*, 1910.

302. HARMAN, B. **A pedigree of five generations of blue sclerotics.** *Ophthalmoscope*, Sept., 1910.

The three cases reported by HOLLOWAY (290, **Congenital pigmentation of the cornea**) showed a bilateral central spindle-shaped pigmented area in the centre of the cornea. In six other cases found in literature the conditions were very similar. The pigment was in the form of dots, reddish brown in color. The symmetry, situation, absence of inflammation, presence of other congenital anomalies, all go to prove that these cases are not acquired. No definite cause has been assigned for this anomaly but it may be due to the uveal pigment passing into the tissue in fœtal life or as the result of intra-uterine inflammation. The cases are allied to those of persistent membrane with adherence to the cornea associated with which pigmentation of the cornea has been observed. These latter cases are explained in the same way as those under consideration. ALLING.

FRANKE (291, **A peculiar form of superficial keratitis**) says that he has many times observed an obstinate, frequently recurring erosion of the cornea which had not been preceded by an injury. Occasionally the formation of furrows may be observed. The shaved-off epithelium showed very insignificant changes. He is inclined to think that this peculiar clinical picture is due to an increase of the physiological process of desquamation of the superficial layers of the corneal epithelium. K.

FUCHS (292, **Dystrophia epithelialis corneæ in infants**) describes a hitherto unknown degenerative affection of the cornea, which he has seen thirteen times. It may be of one or both eyes, appears in old age and usually in women. It begins with a lessened sensitiveness of the cornea; then a stippling and a diffuse cloudiness of the epithelium appear in the pupillary region, resembling the condition in glaucoma. Signs of irritation are present, but the patients complain mainly of the loss of vision. The changes increase slowly, but constantly. Pathologically he found in one case newly formed connective tissue between the epithelium and Bowman's membrane. It is differentiated from glaucoma not only by its long duration, but by the fact that it is not influenced at all by myotics. The etiology and treatment of the disease are not known.

K.

STEPHENSON (293, **Sloughing cornea in infants**) comes to the following conclusions:

1. Keratomalacia in young children is known to occur in practically every country.
2. It affects children whose eyes range from three to twenty months.
3. It occurs chiefly in the children of the poorer classes.
4. In about half the cases it is bilateral.
5. In 50% of the cases it is associated with xerosis.
6. It occurs only in babies whose vitality has been seriously reduced by enteritis, congenital syphilis, athrepsia, or tuberculosis.
7. In London its seasonal incidence closely follows that of zymotic enteritis.
8. Its mortality amounts to 50% of those affected.
9. It leads to blindness in 50% of those who survive.
10. It is associated with no specific micro-organism, although the pneumococcus is present in half the cases.

T. HARRISON BUTLER.

OHM (294, **Ribbon-shaped corneal opacity in a nine-year-old girl**) gives the clinical history and treatment of a case of primary ribbon-shaped opacity of the cornea in a girl nine years old. The youth of the patient is remarkable, as this rare affection is met with almost exclusively in old age. The etiology was not determined; several injections of tuberculin, given for diagnostic purposes, had no effect. Ohm succeeded in obtaining a decided clearing up of the central opacities and quite a considerable improvement of the vision, by several subconjunctival injections of idoide of potassium. From his experience it would seem to be advisable to begin this method of treatment if possible in the commencement of the disease. K.

MOHR (295, **Keratitis parenchymatosa following trauma**) believes that there is a causal connection between traumatism and keratitis parenchymatosa. The individuals must be predisposed to the disease. Syphilis is the chief predisposing factor; whether and how far tuberculosis is to be taken into account remains to be determined. The etiological importance of a traumatism is particularly to be noted in those years

of life in which its appearance from heredity is no longer probable. K.

The number of cases in which lesions of the eye have been proved to be due to malaria is not large. MORANO (296, **Clinical contribution to the study of ocular diseases due to malaria**) had an opportunity to study some cases in which the ocular affection appears to have been caused by malaria. One case was of ulcerative keratitis in a man 34 years old, who had an attack of malarial fever in August, 1907, which yielded in a short time to energetic treatment with quinine. Everything went well until one day the patient was seized with severe headache, accompanied by anorexia, nausea, vomiting, and profuse perspiration. This condition disappeared under proper treatment in the course of a week, but soon after a painful complication called his attention to his right eye in which a large, deep corneal ulcer soon formed, that resembled an ulcus serpens. The aqueous was cloudy and the lower quadrant of the cornea was filled with pus, the level of which rose rapidly. The origin was ascribed to the malarial infection through the examination of the blood. Subcutaneous injections of quinine bichloride, in 1 to 2-gram doses, were given daily and the ulcer soon healed, leaving a not very irregular cicatrix. CALDERARO.

Most of the published cases of mycosis of the cornea were caused by the aspergillus fumigatus. MORAX (297, **Mycosis of the cornea caused by the verticillium graphii**) met with a mycotic infection of the cornea in a man 44 years old, which appeared as round, whitish spots, about 3*mm* in diameter, associated with symptoms of irritation and hypopyon. The spots were removed in toto and recovery quickly followed under the usual treatment. Cultures showed the cause of the infection to be the verticillium graphii. Intravenous, subcutaneous, and intracorneal inoculations in rabbits, mice, and guinea-pigs, produced no results. Only three cases of this infection have been reported hitherto, by Wicherkiewicz, Baguis and Cardone, and Bono, yet the first of these was probably the penicillium, a variety of the verticillium graphii. Cultural examination is absolutely necessary to determine the kind of mycosis present. CAUSÉ.

DICKSON (298, **The operation of pannus dissection**) recom-

mends an improvement over peritomy by incising the conjunctiva about 4*mm* from the corneal margin. Rolling over the flap he dissects the thickened tissue of the pannus from the cornea with iris scissors. This is easily done except where ulcerations have formed more dense adhesions. These may be trimmed off with a knife. He has found no trouble in the healing of the denuded cornea. ALLING.

Necessary conditions for the performance of the new operation for partial staphyloma recommended by KUHNT (299, **Operative treatment of partial staphyloma**) are that the staphyloma does not comprise more than half of the cornea, that the formation of a keratoplastic flap of conjunctiva is possible, and that the eyeball is perfectly free from irritation. Kuhnt forms a large flap of conjunctiva with two pedicles; then he abscises the superficial layers of tissue from the staphyloma, performs a broad iridectomy, and resects, after division of the staphyloma at the sclera, a corresponding, crescentic piece, which he then sutures to the sclera with very fine catgut. Finally the double pedicled flap of conjunctiva is placed over the freshened surface of the staphyloma and secured with silk. Healing is usually smooth, but increase of tension must be watched for carefully. The operation is wearisome and difficult, but is productive of very good results. K.

WOOD and WEBB (300, **Dermoid growth of the cornea in a dog**). A white spaniel puppy had two hairy growths in its cornea, these were dissected off, and examined pathologically.

T. HARRISON BUTLER.

The point of interest in VEASEY'S (301, **Report of a case of epibulbar sarcoma**) case was the appearance of a tumor in a woman of forty at the site of a perforating injury received twenty-four years before. Removal on four different occasions was each time followed by recurrence. Enucleation six years after the first occurrence and no symptoms of return either local or metastatic after a period of sixteen months.

ALLING.

HARMAN (302, **Pedigree of five generations of blue sclerotics**). The pedigree is shown in the usual graphic form, and is an extension of one published by Stephenson in the *Ophthalmoscope* for May, 1910. The sclerotics showed a

curious uniform bluish tinge of a "leaden" hue. The color is probably due to thinness of the sclerotics.

T. HARRISON BUTLER.

Sections XIII.–XIV. Reviewed by Dr. NICOLAI, Berlin.

XIII.—LENS.

303. GIFFORD, B. **An unusual case of Vossius' lens ring.** *Ophthalmic Record*, Aug., 1910.

304. HANCOCK, I. **Three cases of post-operative infection.** *Royal London Ophthalmic Hospital Reports*, Jan., 1910.

305. STANCULEANU. **Cystectomy in the cataract operation.** *Annales d'oculistique*, June, 1910.

306. BUTLER, T. H. **A case of delayed reformation of the anterior chamber after cataract extraction.** *Ophthalmic Review*, Sept., 1910.

307. SCHIELE, A. J. **The effect of subconjunctival injections of sodium iodide, potassium iodide, and of other drugs upon the clearing up of cataract.** *Westn. Ophth.*, 1910, Nos. 7 and 8.

308. KATZ. **The treatment of commencing senile cataract by instillations of salts of iodine in the eye.** *Klin. therap. Wochensch.*, 1910, Nos. 36 and 37.

309. FINK, G. H. **Methods of dealing with the soft matter in cataract operations.** *Ophthalmoscope*, Sept., 1910.

310. VAIL, D. T. **Smith's cataract operation.** *Ophthalmoscope*, June, 1910.

311. FINK, S. H. **The expression of the lens whole in its capsule in cataract extraction.** *Ophthalmoscope*, June, 1910.

312. HULEN, V. H. **A new operation for the extraction of a cataract in its capsule.** *Ophthalmic Record*, Dec., 1910.

GIFFORD (303, **An unusual case of Vossius' lens ring**) accepts the explanation of this phenomenon given by Hoeg who considered the compression of the aqueous by the eyeball as the cause. The pressure of the iris on the capsule would thus be brought about. Vossius, on the other hand, thought that the cornea itself was actually forced against the lens. As force is transmitted equally in all directions in liquids, the Hoeg theory would not presuppose a blow delivered directly upon the centre of the cornea. He cites a case in which a glancing blow on the periphery of the cornea produced the typical ring with numerous opacities through the anterior surface of the lens as well as within the ring. ALLING.

HANCOCK (304, **Three cases of post-operative infection**). All three cases developed iridocyclitis after extraction; the

first two were due to infection with staphylococcus albus, the last only yielded a culture of xerosis bacillus. Vaccine was used but in the first case it did no good, in the other two harm. All three had septic mouths, but most probably the source of infection was the conjunctiva, for the staphylococcus albus is present in from 80% to 96% of all eyes. Axenfeld and others regard it as harmless, but it would appear to be dangerous in cases where soft lens matter is left behind.

T. HARRISON BUTLER.

STANCULEANU (305, **Cystectomy in the cataract operation**) has devised a new capsule forceps with which to tear out the anterior capsule. Its advantage consists in the possibility of seizing the capsule easily, in consequence of the great curvature of its blades, and of removing a large part of the capsule without injury to the iris.

BUTLER (306, **Delayed reformation of the anterior chamber after cataract extraction**). The paper reviews Widmark's views on the subject, and describes a case in which probably a tag of capsule caused delayed union. As soon as the wound closed glaucoma supervened which, however, spontaneously disappeared. The final result was V = $\frac{6}{6}$.

T. HARRISON BUTLER.

SCHIELE (307, **Subconjunctival injections to clear up cataract**) tried subconjunctival injections of a 1:1000 solution of iodide of sodium with one drop of a 1% solution of acoin added to the gram, in a girl 17 years old, who had a soft cataract in one eye, the vision of which was 0, the other eye being healthy. After fifty injections, in the course of seven and one-half months, the cataract had lost its white color and the pupil was black. Some months later the white color reappeared and the cataract had to be removed for cosmetic reasons. Retinitis pigmentosa was present, He uses subconjunctival injections of sodium iodide for a long time in commencing cataract and finds them of special benefit in traumatic cataract.

HIRSCHMANN.

KATZ (308, **Treatment of commencing cataract with instillation of salts of iodine**) recommends from his own experience in sixty cases the instillation of a 5% solution of sodium iodide. The vision improves and in some cases he saw the lenticular

opacities clear up. The method is harmless, except for occasional irritation of the conjunctiva.

FINK (309, **Methods of dealing with soft lens matter**). The author advises that in cases where the lens is not quite ripe the pupil should be dilated. If the soft matter cannot be expressed some papain may be introduced. After a little time the fragments may be removed by irrigation. Smith's operation is often accompanied by loss of vitreous. The author of this short note does not state whether he has tried this method of "rapid digestion" or not. T. HARRISON BUTLER.

VAIL (310, **Smith's cataract operation**). The author journeyed to India to see Smith perform his operation. He did several himself and has now started the operation in India. He considers it to be the operation of election for immature cataracts. But the operation must be performed exactly as Smith himself performs it, or nothing but disaster can be expected. T. HARRISON BUTLER.

FINK (311, **Extraction of the lens in its capsule**) The author, in a very involved paper whose exact inwardness it is difficult to grasp, recommends his "eclectic method" which is described in his book, *Methods of Operating for Cataract.* We gather that if the lens cannot be delivered by light pressure the capsule should be ruptured. This sensible advice has recently been given in an article published in an American Journal of Ophthalmology. Fink points out that even after extraction in the capsule a semi-opaque membrane may be left; this is the thickened hyaloid membrane. We can ourselves confirm this statement. Once when extracting a lens from a Soudanese he gave a sudden jump and shot his lens out with great force. A membrane remained behind which required discission although the lens escaped in its capsule. T. HARRISON BUTLER.

HULEN'S (312, **A new operation for the extraction of a cataract in its capsule**) operation is of interest on account of its novelty. He employs an instrument with a cup-shaped extremity which is connected through a hollow handle with a vessel having a vacuum of twenty-five pounds. When the cup is introduced into the anterior chamber and rests upon the anterior surface of the lens the suction is turned on, and the lens after being dislocated is gently lifted out through the wound. ALLING.

XIV.—IRIS.

313. GALEZOWSKI. **Heterochromia of the iris.** *Rec. d'opht.*, xxxii., p. 169.

314. JEANSELME and POULARD. **Sporotrichosis of the iris in general sporotrichosis.** *Société d'ophtalm. de Paris*, July 5, 1910.

315. MOLESWORTH, T. H. **Irido-dialysis.** *Brit. Med. Jour.*, 1910, i.

316. VERHOEFF, F. H. **The histologic findings in a case of tuberculous cyclitis and a theory as to the origin of tuberculous scleritis and keratitis.** *Trans. Amer. Ophthalm. Soc.*, 1910.

317. THORINGTON, J. **Report of a case of leucosarcoma of the iris successfully removed by iridectomy and useful vision retained.** *Ibid.*, 1910.

318. WOOD, C. A. **Progressive, primary (?) atrophy, and almost complete disappearance of the right iris.** *Ophthalmoscope*, Dec., 1910.

GALEZOWSKI (313, **Heterochromia of the iris**) supposes that the heterochromia of the iris, or the depigmentation of one iris, may be the consequence of a lateral, chronic uveitis, that may appear during intra-uterine life. In a later period of development this uveitis causes precipitates on the posterior surface of the cornea and is almost always accompanied by the development of cataract.

JEANSELME and POULARD (314, **Sporotrichosis of the iris**) observed an iritis in a man 46 years old, which was caused by sporotrix, but gave the clinical symptoms of a gummatous iritis. Wassermann was negative. Cultures of the pus of the nodes developed sporotrix and a very intensive sporo-agglutination was obtained. Treatment with iodine was successful. The sporotrix entered through an ulcer of the foot, settled first in the knee joint and lower part of the femur, and made amputation necessary.

MOLESWORTH (315, **Irido-dialysis**) reports the following case. A man who had been struck in the right eye with a piece of wood was found to have a cleft in the iris on the temporal side at the junction of the outer and middle third; there was no injury to the lens, and no hyphæmia, but some diminution of vision. The eye was treated with atropin and cocaine drops and kept bandaged for ten days. Subsequently no trace of the cleft could be seen, and the vision was raised to normal.

A. H. PAYAN DAWNAY.

VERHOEFF (316, **The histologic findings in a case of tuber-**

culous cyclitis and a theory as to the origin of tuberculous scleritis and keratitis) points out the importance of tuberculosis as the cause of these cases and suggests that the infection reaches the sclera through the filtration angle, the original focus being in the ciliary body. In keratitis alone the infection may also come through the aqueous, the cornea being infected either by metastasis or from a focus in the sclera. The lesion in the ciliary body is a superficial punctate tuberculosis. He gives results of an exhaustive examination of an eye which bear out these conclusions.

ALLING.

The tumor removed by THORINGTON (317, **Report of a case of leucosarcoma of the iris successfully removed by iridectomy and useful vision retained**) was 3*mm* by 4*mm* in size and covered the iris from near the periphery to the pupillary edge. It was whitish yellow and a few vessels ran over it. There was no history of trauma or evidence of tuberculosis or syphilis.

ALLING.

WOOD (318, **Progressive atrophy of the iris**). The patient had had a fracture of the right superior maxilla, which was followed by suppuration in the right antrum. This may however have been due not to the accident but to an attack of influenza. After simple drainage through the nose this condition cleared up. The patient himself made sketches which are reproduced in the article and illustrate the gradual enlargement of the pupil as the iris atrophied. This was accompanied by increased tension. For some time vision was $\frac{20}{40}$ and Jaeger 1. Neither mydriatics nor myotics had any action upon the size of the pupil or the tension. The iris was abnormally pitted, and except at the pupil margin the uveal layer was almost undisturbed. The absorption of the iris tissue seems to have begun on the anterior surface and to have proceeded irregularly there, whereas the pigment layer has only been absorbed at the pupil edge. The fields remained uncontracted for a long time. Latterly glaucomatous symptoms became more pronounced, and the fields contracted. The eye was ultimately enucleated. An account is given of the pathological anatomy.

T. HARRISON BUTLER.

XV.—THE PUPIL. Reviewed by Prof. HUMMELSHEIM, Bonn.

319. LAUBER. **A case of absence of the pigment edge of the margin of the pupil.** Meeting of the Ophthalm. Soc. of Vienna, May 11, 1910.

320. WEILER, KARL. **Study of the pupils and of the movements of the iris in man.** *Zeitsch. f. d. ges. Neurol. u. Psychiat.*, ii., p. 2.

In LAUBER'S (319, **Absence of pigment edge of pupil**) patient, a man 72 years old, with senile cataract, the pupillary edge appeared homogeneous and gray with the binocular microscope, brighter than the iris stroma. On scleral transillumination the pupil appeared considerably larger than otherwise, because the pupillary marginal zone of the iris allowed the passage of light. Mydriatics did not dilate the pupil, because the margin was rigid. Everything seemed to indicate the presence of a hyaline degeneration.

WEILER (320, **The pupils and the movements of the iris in man**) studied the physiology of the pupil in eighty-four healthy persons of different ages and found that a considerably greater effect was produced by a slight stimulation with light with the least possible tonicity of the sphincter, than by a strong innervation of the sphincter and great brightness. He irradiated one pupil and then, when both were equally contracted, irradiated the other with the same degree of light, and then saw an increase of the myosis to an average of 0.4 to 0.5*mm*. He calls this the secondary reaction and considers it to be the total phenomenon that the central nervous system can produce by the light reflex, and an inference can be drawn from the sensitiveness of this apparatus which may be of importance in the localization of the cause of a pupillary disturbance.

Sections XVI.–XIX. Reviewed by Dr. NICOLAI, Berlin.

XVI.—CHORIOID.

321. LANGENHAN. **Diagnosis of intraocular tumors by transillumination of the fundus of the eye.** *Berl. klin. Wochensch.*, 1910, No. 24.

322. BORNANCINI. **Ossification in the eye.** *La Clinica Oculistica*, Oct. and Nov., 1909.

323. BUTLER, T. H. **A clinical study of obsolescent tuberculous chorioiditis of the macular region in children.** *Ophthalmoscope*, June, 1910.

324. KOLLNER, C. **Recurrent tuberculous chorioiditis.** *Ibid.*, Sept., 1910.

325. KOLLER, CARL. **Recurrent tuberculous chorioiditis.** *Trans. Amer. Ophthalm. Soc.*, 1910.

LANGENHAN (321, **Diagnosis of intraocular tumors by transillumination of the fundus of the eye**) recommends transillumination from the fauces and believes that in this way the differential diagnosis can be made whether a tumor or a serous detachment of the retina is present.

BORNANCINI (322, **Ossification of the eye**) examined five cases histologically in which there was more or less ossification of the chorioid. Four of these were stumps, but one was an eyeball in which the size and form were those of a normal organ. The most noteworthy phenomenon met with was the formation of metablastic bone tissue with true bone marrow, a product that differed from normal tissue only in its heterotropia, but neither in its histological construction nor in its functional attributes. He thinks the process was at first a simple ossification and that the marrow appeared later.

BUTLER (323, **Obsolescent tuberculosis of the macula in children**). This disease has been described by Stephenson and Carpenter, but with this exception has received scant notice at the hands of ophthalmologists. None of the atlases of ophthalmoscopy describe it, although some of them figure similar conditions, but regard them as congenital malformations or ascribe them to syphilis. Yet the disease is far from uncommon. Butler has seen at least eight cases among 5000 patients. The children are generally perfectly healthy, often country bred. There is a large atrophic patch at the posterior pole surrounded by a ring of pigment. The author has proved the tuberculous ætiology by the use of Koch's Old Tuberculin. In some cases this caused a well marked disturbance of the pigmentation, and this was regarded as a local reaction. In one case there was an obsolescent patch in the right eye. After a year tubercles were observed at the posterior pole of the left eye. These rapidly disappeared when tuberculin was used. The conditions observed are illustrated by six drawings of the fundus made by the author. The paper should be read in conjunction with Stephenson's

paper in the *Reports of the Society for Study of Disease in Children*, vol. i., 1901, p. 169. T. HARRISON BUTLER.

KOLLNER (324, **Recurrent tuberculous chorioiditis**) states that years ago V. Michel pointed out that 40–50% of all cases of disease of the uveal tract were tuberculous in origin, yet his teaching fell upon deaf ears, and tuberculosis as a cause of chronic chorioidal inflammation was rarely recognized. In 1901, Sydney Stephenson and Carpenter described cases of tuberculous chorioiditis in children, and showed that such cases could become obsolescent and were not necessarily followed by general dissemination of tubercle. Kollner describes a special form of tuberculosis of the chorioid which can occur in healthy adults. The cases cited showed in common, recurrence, the development of precipitates and vitreous opacities at an early stage, an intense papillitis, an early central location of foci of circular or oval shape.

T. HARRISON BUTLER.

KOLLER (325, **Recurrent tuberculous chorioiditis**) insists that many cases of recurrent exudative chorioiditis are tuberculous, offering as evidence the fact that tuberculosis is prevalent, that tubercle bacilli have been reported found in the aqueous in one case, and that he got a local reaction after diagnostic injection. ALLING.

XVII.—VITREOUS.

326. TERLINEK. **Infection of the vitreous by a fluorescent, non-liquefying bacillus.** *Soc. Belge. d'ophtalmologie*, May, 1910.

327. BRIBACH. **The central canal of the vitreous.** *Arch. f. Ophthalm.*, lxxvi., No. 1, p. 203.

The microscopic examination of Terlinek's (326, **Infection of the vitreous**) case revealed a gram-negative, short bacillus, which liquefied gelatine and serum. A similar one has been found in the Pasteur Institute in the pus from a meningitis.

BRIBACH (327, **The central canal of the vitreous**) maintains, as the result of his investigations, that a hyaloid canal exists in the developed eye. He considers the objections raised by Wolfrum to be not pertinent. The method of investigation, carried out on two hundred and fifty animals' eyes, is described in detail.

XVIII—GLAUCOMA

328. ALLPORT, WILFRID. **Infantile glaucoma, or buphthalmia.** *Brit. Med. Jour.*, 1910, i., p. 563.

329. LEVINSOHN. **The influence of the external ocular muscles upon the intraocular tension.** *Arch. f. Ophthalm.*, lxxvi., p. 129.

330. ISCHREYT, G. **A prodrome of primary glaucoma.** *Klin. Monatsbl. f. Augenheilkunde*, Aug., 1910, p. 175.

331. MOUYE, T. **A case of obstruction of the central vein and glaucoma, with remarks.** *Royal London Ophthalm. Hosp. Reports*, Jan., 1910.

332. STEPHENSON, SYDNEY. **Arteriosclerosis, thrombosis of the central artery of the retina, acute glaucoma, posterior sclerotomy, iridectomy, enucleation of the eyeball, death, pathological examination of the eyeball.** *Ophthalmoscope*, Sept., 1910.

333. ELLETT, E. C. **Spontaneous rupture of the eyeball.** *Jour. Amer. Med. Assoc.*, July 16, 1910.

334. ABADIE. **Cyclodialysis, a new operation for cases of glaucoma in which iridectomy is ineffective.** *Soc. franç. d'ophtalm.*, May, 1910.

335. GOLOWIN. **Operations on the eyeball after resection of the optic and ciliary nerves.** *Westn. Ophth.*, 1910, No. 11.

336. RISLEY, S. L. **Glaucoma after cataract extraction.** *Ophthalmology*, July, 1910.

337. KNAPP, A. **Glaucoma from adhesions of the lens capsule to the cornea.** *Trans. Amer. Ophth. Soc.*, 1910.

338. GREENWOOD, A. **The filtering cicatrix for chronic glaucoma.** *Jour. Amer. Med. Assoc.*, July 16, 1910.

339. ELLIOTT, R. H. **The operative treatment of glaucoma.** *Ophthalmoscope*, July, 1910.

340. ELLIOTT, R. H. **Trephining for glaucoma.** *Ophthalmoscope*, Nov., 1910.

341. LANGENHAN. **Contributions to ophthalmotonometry.** *Zeitsch. f. Augenheilkunde*, No. 3, 1910.

ALLPORT (328, **Infantile glaucoma, or buphthalmia**) reports a case which he first saw at the age of six months, and advised a course of pilocarpine drops. He did not see the patient for four years; there were then high tension, photophobia, and corneal nebulæ. He performed anterior sclerotomy leaving a bridge of conjunctiva between the cornea and sclera under which in each eye a small cystoid cicatrix formed. After two years the eyes have remained quiet, tension normal, and the vision has improved, the patient with a small minus cylindrical correction being able to read easily J.5 at about six inches. The optic disks are pale but not cupped.

A. H. PAYAN DAWNAY.

LEVINSOHN (329, **Influence of external ocular muscles upon**

the intraocular tension) has proved experimentally that the convergence of the eyes and the little jerkings of the eyes in reading and writing are unable to increase the intraocular tension. The results of the experiments were confirmed by tonometric measurements. Stronger muscular contractions, produced by electric stimulation, were able to increase the tension.

ISCHREYT (330, **A prodrome of primary glaucoma**) examined an eye removed because of carcinoma of the lid and found in it a histological condition which he supposes to be a prodrome of glaucoma. The condition was one of inflammation of the anterior outflow passages and all opposition of the root of the iris to the margin of the ciliary body.

MOUYE (331, **Glaucoma and obstruction of the central vein**) describes a case in which the eye had to be excised and was examined in the laboratory of the hospital. The appearance of some of the sections is shown by micro-photographs, and a scheme of the central vessels has been constructed from serial sections. The author is of opinion that the thrombosis of the vein precedes the glaucoma. It causes retinal hemorrhages, and the blood corpuscles, on disintegrating, liberate toxines. These are carried forward and induce inflammatory changes at the iridic angle which cause adhesions, and glaucoma follows. T. HARRISON BUTLER.

STEPHENSON (332, **Arteriosclerosis, thrombosis of central artery followed by acute glaucoma**) describes the following case. A patient with arteriosclerosis and a tendency to glaucoma received by a dispenser's mistake atropine instead of eserine drops. Subacute glaucoma supervened. This was treated by posterior sclerotomy and iridectomy. The tension was not permanently reduced, so the eye was enucleated. Seven days later the patient died from an unknown cause. The eye when sectioned showed thrombosis of the central vein. T. HARRISON BUTLER.

ELLETT (333, **Spontaneous rupture of the eyeball**) recites a case of rupture occurring in absolute glaucoma, having collected twenty-two cases. In nearly all of these there was no history of strain or traumatism. Whether the rupture occurs as the result of intraocular hemorrhage or whether there is a previous ulceration of the cornea which on rupturing suddenly

relieves the pressure and gives rise to the hemorrhage is undecided. The reviewer would add another case of his own in which the cornea was not ulcerated before the rupture. He believes it possible for intraocular hemorrhage to raise the pressure sufficient to break through the weakened tissues in view of the hydraulic principles involved. ALLING.

ABADIE (334, **Cyclodialysis after ineffective iridectomy**) has employed cyclodialysis in cases in which the tension remained plus, or soon rose again after an iridectomy. In this way he has avoided enucleation even in absolute glaucoma.

GOLOWIN (335, **Operations on the eyeball after resection of the optic and ciliary nerves**) performed neurectomia opticociliaris on two patients with absolute glaucoma, and later, after twenty-four days in one case, after two days in the other, extracted the lens for cosmetic reasons. A good recovery followed with a satisfactory cosmetic result.

HIRSCHMANN.

RISLEY (336, **Glaucoma after cataract extraction**) describes the case of a patient who for seventeen years after a cataract extraction with a broad iridectomy enjoyed good vision. He then developed attacks of subacute glaucoma which finally passed into a chronic state, showing tension, plus two, vision reduced to 1 p. in a small area, cupped and atrophied disk. There was no disease of uveal tract and no mention is made of the condition of the other eye. ALLING.

KNAPP (337, **Glaucoma from adhesions of the lens capsule to the cornea**) points out the unfortunate sequel which may follow perforating wounds of the cornea or cataract extraction when the capsule becomes adherent to the cornea. He relates six cases of this form of secondary glaucoma. The cause seems to be the traction of the capsule on the ciliary body with obliteration of the iris angle. The worst cases are those with adhesions nearest the centre of the cornea. Total absence of the iris does not prevent this condition, hence iridectomy is not effectual. After cataract extraction, especially with iridectomy, the entanglement of the capsule is quite frequent and glaucoma is liable to follow. The treatment should be an attempt to divide the bands but this is difficult and unsatisfactory. ALLING.

GREENWOOD (338, **The filtering cicatrix for chronic glau-**

coma) has performed the operation of Lagrange four times and in two of the cases two years have elapsed. He is of the opinion that the operation has a permanent place in ophthalmology. ALLING.

ELLIOTT (339, **The operative treatment of glaucoma**), in a paper read before the Madras branch of the British Medical Association, describes his operation (Freeland Fergus's trephining operation) for the relief of glaucoma. We gather from the paper that he is not restricting the procedure to chronic glaucoma and subacute cases, but is also applying it to acute glaucoma. Here most authorities will disagree with him. In this paper the author favors a *2mm* to a *2½mm* instrument, but in others he advises one of *1.5mm* diameter. No general anæsthetic is employed; if there be much congestion, the subconjunctival injections of cocaine and adrenaline have given great satisfaction, and further trial is being made to ascertain the exact value of this way of using the local anæsthetic. There is a table which gives particulars of the cases brought forward, which number 128.

T. HARRISON BUTLER.

ELLIOTT (340, **Trephining for glaucoma**). Further experience has led Major Elliott to the following conclusions: Vitreous escape can be avoided or almost avoided by keeping close to the limbus and using a small trephine. Filtration appears to be too free when a *2mm* or *2.5mm* trephine is used. Elliott now employs one of *1.5mm*. If the wound be aseptic, it does not fill up. It is important to enter the anterior chamber. If the hole does not enter the chamber, Elliott dissects well into the chamber with sharp-pointed scissors. We must look out for a quiet iritis which may follow this operation. To guard against this the author instills atropine on the third day. T. HARRISON BUTLER.

LANGENHAN'S (341, **Contributions to ophthalmotonometry**) numerous measurements with the tonometer give interesting results. The average tension is about *21mm* of mercury. Holocain and atropine change it but little, pilocarpine and eserine reduce it, cocaine only slightly; tenotomy and advancement do not reduce the tension in myopia. There is a slight increase of tension in exophthalmic goitre, which may be temporarily increased by subconjunctival injections of salt.

Intraocular tumors reduce the tension at first. Regarding the use of myotics in glaucoma, cocaine is to be avoided, even in conjunction with drugs that reduce the tension.

XIX.—SYMPATHETIC OPHTHALMIA.

342. Asmus and Mellinghoff. **A bad case of sympathetic ophthalmia.** *Zeitschrift. f. Augenheilkunde*, xxiv., p. 335.

343. Snellen. **Three cases of sympathetic ophthalmia.** *Niederlaend. Ophthalm. Gesellschaft*, June 5, 1910.

344. Gifford, H. **The danger of sympathetic ophthalmia from the use of the cautery in the treatment of iris prolapse.** *Jour. A. M. A.*, July 30, 1910.

Asmus and Mellinghoff (342, **A bad case of sympathetic ophthalmia**) report the following case: In September, 1900, the patient suffered from a broad, contused wound of the cornea, followed by cataract, adhesions of the iris, secondary cataract, secondary glaucoma, and blindness in one eye. Consent to operation was refused and the blind eye remained untouched. In 1904 the good eye developed the usual symptoms of sympathetic ophthalmia. As the result of urgent advice the injured eye was enucleated at the end of five days; inunctions, dark glasses, and atropine and cocaine ointment were prescribed. After a fluctuating course of a year the eye finally became blind. There was a fresh, active infiltration, especially in the chorioid of the injured eye.

Snellen (343, **Three cases of sympathetic ophthalmia**) reports two cases in which sympathetic ophthalmia followed exenteration, and one that followed enucleation of the injured eye. Recovery took place after the removal of the scleral stumps of the former and of a piece of uveal tissue that had become separated from the eyeball and left behind at the enucleation. The scleral stumps contained uveal tissue. The same form of inflammation was found in all that occurs in sympathetic ophthalmia. Snellen thinks, from this experience, that exenteration is dangerous and should be practised only in panophthalmitis. R. P. Visser.

Gifford (344, **The danger of sympathetic ophthalmia from the use of the cautery in the treatment of iris prolapse**) issues a word of caution regarding the use of this procedure. He thinks that prolapses that cannot be cleanly excised should

if possible be cauterized but afterward scraped and covered by a conjunctival flap. Where there is a large prolapse unsuitable for this method he advocates daily applications of tri-chloracetic acid but does not deny the possibility of the same danger. ALLING.

Sections XX.–XXIII. Reviewed by Dr. H. MEYER, Brandenburg.

XX.—RETINA AND FUNCTIONAL DISTURBANCES.

345. MAGITOT. **Angioid pigmentation of the retina.** *Annales d'oculist.*, lxxiv., pp. 12 and 26.

346. CASALI. **A new contribution to the etiology and pathogenesis of retinitis proliferans.** *Annali di ottalmologia*, Nos. 11 and 12, 1909.

347. DOR. **Treatment of detachment of the retina with tuberculin.** *La clinique ophtalm.*, xvi., p. 365.

348. CURTILL. **Two cases of metastatic ophthalmia simulating glioma of the retina.** *Rev. générale d'ophtalm.*, xxix., p. 529.

349. BERGMEISTER. **Contribution to the question of glioma.** *Zeitschr. f. Augenheilk.*, xxiv., p. 321.

350. HARBRIDGE, D. F. **Sudden obstruction of the retinal circulation. The report of two cases and notes concerning a previously reported case.** *Annals of Ophthalmology*, July, 1910.

351. BAHN, C. A. **A rare anomaly of the inferior vein of the retina.** *Ophthalmology*, July, 1910.

352. KNAPP, A. **Intermittent closing of retinal arteries.** *Jour. Amer. Med. Assoc.*, June 25, 1910.

353. BRUNS, H. D. **A spasm of the retinal arteries.** *Trans. Amer. Ophthalm. Soc.*, 1910.

354. DOYNE, R. W. **Retinitis pigmentosa.** *Ophthalmoscope*, Sept., 1910.

355. BUTLER, T. HARRISON. **On the futility of the official tests for color blindness.** *British Med. Jour.*, 1910, vol. i.

MAGITOT (345, **Angioid pigmentation of the retina**) gives the clinical and anatomical description of a case of striated pigmentation of the retina, met with in a woman 65 years old, who suffered from loss of vision at the same time as softening of the brain. Ophthalmoscopically black points could be seen grouped in lines, which followed courses like pseudo-vessels, disappeared near the papilla, and did not extend over the ora serrata. The pseudo-vessels were covered with black points and forked. The serious visual trouble was not due to the retinal change alone, but, as was shown at the

autopsy, primarily to an almost complete destruction of both cunei. The histological examination of the two eyes revealed a sclerosis that affected almost all of the vessels, but particularly the capillaries, of all the membranes of the eye, which had totally obliterated many. The chorioid and the deep vascular network of the retina were pre-eminently involved. In the latter the principal change lay in the inner granular and plexiform layer. It consisted of punctate and larger roundish, or striated hemorrhages, some older and some younger. The latter, which were the more reddish, permitted the morphological constituents to be recognized, while the former, of a brown or deep black color, appeared quite amorphous. Newly formed vessels like those found by Lister, could not be discovered. The clinical picture could be simulated merely by hemorrhages and their transformation. CAUSÉ.

CASALI (346, **Etiology and pathogenesis of retinitis proliferans**) enunciated the view in 1906 that the origin of the bands and plaques of connective tissue of retinitis proliferans were in part to be ascribed to the hemorrhages in the vitreous adherent to the large vessels of the retina and papilla, that the blood clot causes all inflammatory reaction in the wall of the vessel to which it is adherent, and that the tendinous cords and plaques that characterize this disease are derived from the organization of the granulation tissue. He now reports a case that fully substantiates this theory. This case also shows the slight importance of syphilis as the cause of the disease, as it was perfectly excluded. There is a syphilitic disease of the retina and vitreous which exhibits ophthalmoscopically a picture similar to that of retinitis proliferans; the differentiation can be made through its etiology, its anatomical construction, and its response to antisyphilitic treatment, while true retinitis proliferans is incurable. The author does not say that there are no cases of retinitis proliferans in which there is no dircet connection with intra-ocular hemorrhage, but he considers them rarities.

CALDERARO.

BOOK REVIEWS

I —**Anatomie und Histologie des Menschlichen Augapfels. Seine Entwicklung und sein Altern. (The Anatomy and Histology of the Eyeball.)** By Prof. MAXIMILIAN SALZMANN, Vienna. With five figures in the text and nine plates. Pages, 249. Published by Franz Deuticke, Leipzig and Wien, 1912. Price, Mk. 16.

It is a remarkable fact that among all the books that have been written upon the eye there is not one dealing adequately and exclusively with the normal anatomy and histology. That found in most current text-books is inaccurate and at best scattered through various chapters. The "Graefe-Saemisch" is too encyclopædic and often disproportionate. Our best general anatomy atlases do not have enough explanatory matter, nor do they present the subject in an orderly progressive manner.

A descriptive anatomy of the eye, by so well-known a teacher and investigator, will therefore be received by many, especially of the younger generation, with a feeling of almost personal gratitude, as something authoritative, definite, concise, unequivocal, to "begin on" and to which they may always come back.

The text comprises some 250 pages, including 200 pages on the eyeball as a whole, the special anatomy and histology of the sclera, cornea, the sinus angle, perichorioidal space and suprachorioidea, the choroidea, the pigment epithelium of the choroidea, the retina, optic nerve, ciliary body, iris, vitreous, zonula, lens, the anterior and posterior chambers; the remaining pages are devoted to a consideration of the physiological changes which the eye undergoes during fœtal and embryonal life, the extra-uterine development and subsequent

growth of the eyeball, and the changes incident to advanced age.

Special attention is given to the topography and finer anatomy of the limbus region, the sinus-angle structures, the vitreous body and its fixation to the structures immediately in front of the ora serrata by means of its base; the complicated anatomy of the optic nerve entrance canal is given in great detail and two valuable pages added in explanation of the relationship between the anatomic and ophthalmoscopic pictures.

Many things are still unsettled and often the author does not even express a view as to which is correct, but apparently when he feels that the time has come to take a position in a matter he does so with entire definiteness—for instance, that there are no lymph channels in the corneal stroma, Schlemm's canal is not a venous sinus and there is no direct continuity between the spaces of Fontana and the canal lumina, the iris muscles are derived from the pigment epithelium, sclerotic tissue in the base of a ciliary process is normal, the vitreous is ectodermal, there is only one membrane between the retina and vitreous, there is a hyaloid canal, the red reflex of the fundus comes from the pigment epithelium, the fovea is dark because the slope of the clivus reflects the light to one side.

Five figures accompany the text and the reading matter is further enriched by a superb series of plate drawings by the author himself—107 in number reproduced by a new "Licht Druck" process. It is probably not too much to say that these represent months of work on the part of the author and are the most perfect extant.

The whole work possesses distinct literary merit. Figures of speech abound and charming allusions do away with the monotony one usually finds in anatomic works. As in all German works, one finds a different conception of the paragraph from that of our own, but the matter is so clearly set forth that one reads on and on all but unconscious of the fact that what seems really to belong in one paragraph is put into two.

E. V. L. Brown.

II.—**Pathology and Bacteriology of the Eye.** By E. Treacher Collins and M. Stephen Mayou. One of the

volumes in the International System of Ophthalmic Practice. Edited by Dr. W. L. Pyle. With three colored plates and 237 figures in the text. Pages, 558. Philadelphia: P. Blakiston's Son & Company, 1911. Price, $3.00.

The arrangement of the book is novel and interesting. Departing from the usual custom of treating separately of the affections met in each anatomic subdivision, the subject is handled more broadly by dividing the various diseases into several processes which occur during life. While it seems that points have often had to be stretched to accommodate this classification yet it has added unquestionably to the readability of the book. Chapter I treats of Aberrations in Development. This is one of the best chapters and the presentation of the subject matter is clever and interesting. Chapter II is devoted to Neoplasms. In Chapter III on the Derangements in the Circulating Fluids of the Eye and of the Vessels in which they are Contained, the subject is divided up into (1) Diseases due to changes in the vessel walls. (2) Diseases due to changes in the blood. (3) Toxic amblyopia. (4) Glaucoma. The part on glaucoma is especially commendable. Chapter IV deals with Injuries. Under the heading of Inflammation in Chapter V an excellent description of our present knowledge of humoral pathology is given. The special part of the chapter describes the inflammation in the various structures of the eye. Chapter VI treats of Parasitic Diseases Affecting the Eye, with a description of the bacteria, fungi, and animalculæ (spirochæta) and diseases which are probably due to micro-organisms (trachoma, sympathetic ophthalmia). Under Degenerations in Chapter VII the important subject of cataract is taken up. A final chapter on Practical Methods describes the usual laboratory methods applied to the eye.

This book will be read with interest by every ophthalmologist and the authors deserve our best thanks for the really admirable presentation of a subject to which they have made so many original contributions. The illustrations are not elaborate but in most cases clear and adequate.

A. K.

III. **The Pocket Atlas and Text-Book of the Fundus Oculi,** with note and drawing book by Dr. G. LINDSAY JOHN-

SON, with drawings from life by ARTHUR W. HEAD. London: Adlard and Son, 1911. Price, 10/6 net.

This book, which is small enough to be carried about in the pocket, brings a history of the ophthalmoscope, the methods of its use, and the determination of refraction inclusive of retinoscopy. After a description of the anatomy of the chorioid, retina, and optic nerve and their ophthalmoscopic appearance, each disease of the fundus is briefly described with clinical notes and treatment.

An important part of any atlas is of course the pictures. That they are the work of A. W. Head is sufficient to testify to their excellence. A small note book accompanies the atlas with directions for gross drawings of fundus changes. The price is very reasonable and the book may well be recommended to those beginning to use the ophthalmoscope.

A. K.

IV.—**Atlas der Entwickelungsgeschichte des Menschlichen Auges (Atlas of the Embryology of the Eye).** By Professor L. BACH and Dr. R. SEEFELDER. Part I with twenty-four figures in the text and Plates I–XV. Leipzig: W. Engelmann, 1911. Price, Mk. 20.

The authors, who are well known for their contributions on the embryology of the eye, have succeeded in collecting a sufficiently complete series of human specimens illustrating the development of the eye. The difficulty of obtaining a complete series is well known; this has been made possible through the co-operation of the anatomical departments of several universities and of numerous colleagues. This part deals with the optic furrow, the optic vesicle, the relation of the mesoderm to these structures, the transformation of the optic vesicle into the optic cup, the indentation of the rim of the cup, and the lens. The microscopic changes in these structures are shown on fifteen colored plates. These drawings are beautifully done and their reproduction is a tribute to the printing art. The atlas promises to be a classic and an achievement for both the authors and the publisher.

A. K.

V.—**The Ophthalmic Year Book,** Volume VIII., by E. JACKSON, T. B. SCHNEIDEMAN, and W. ZENTMAYER. Illustrated.

Pages, 455. The Herrick Book and Stationery Company, Denver, Colo., 1911. Price, $4.00.

This Year Book reviews the ophthalmic literature for 1910. The general arrangement of the book has not been changed; there is more subject matter and the high standard of the book has been maintained. The work has been done by the three editors and Dr. W. H. Crisp. In the preface a plea is made for more subscribers. Though probably no ophthalmic journal in this country has a large enough circulation to pay expenses, it would seem that the merits of this Year Book must be sufficiently apparent to every active oculist to lead him to subscribe and to show some appreciation of the editor's labors.

A. K.

VI.—**Manual of the Diseases of the Eye.** By Dr. CHARLES H. MAY. Seventh Edition, Revised. Pages, 407. New York: W. Wood & Co., 1911. Price, $2.00.

It is a pleasure to observe the continued popularity of this little manual which has made a new (the seventh) edition necessary. The subject matter has been kept fully abreast by addition of new paragraphs and a chapter on the ocular manifestations of general diseases. The size of the book has been but slightly increased, while its moderate price remains unchanged.

A. K.

VII.—**Retinoscopy.** By Dr. JAMES THORINGTON. Sixth Edition. Pages, 71. Philadelphia: P. Blakiston's Son & Co., 1911. Price, $1.00.

This excellent and short description of this important objective method of examining the refraction of an eye by Dr. Thorington now appears in a sixth edition. New illustrations have been added and the text has been revised.

A. K.

VIII.—**Traitement adjuvant du Strabisme (Adjuvant Treatment of Strabismus).** By F. TERRIEN and HUBERT. Pages, 292. Paris: G. Steinheil, 1912. Price, Fr. 4.

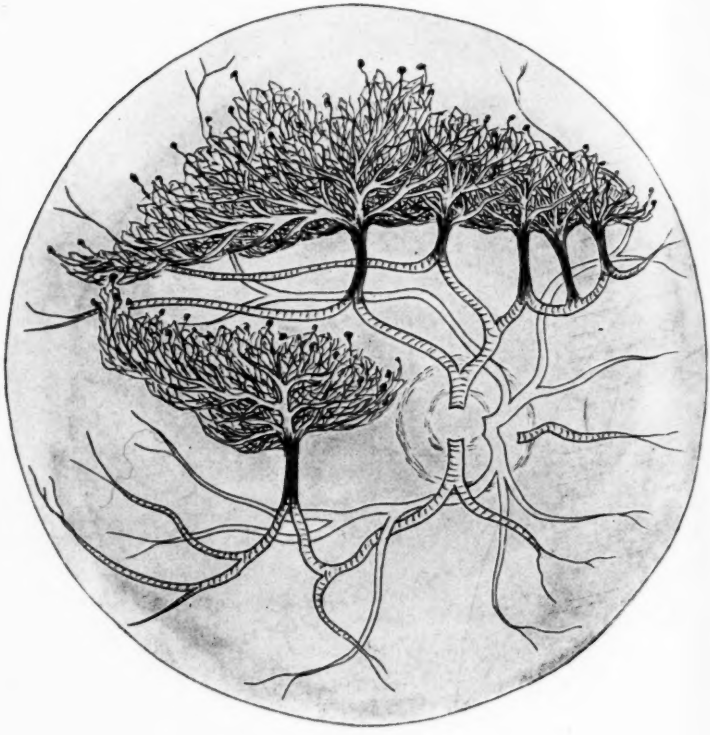
The treatment of strabismus other than by glasses and operation is being generally accepted to be of great importance.

The authors have collected in a small and handy volume the way in which the orthoptic treatment of squint should be followed out. The directions are simple enough for parents to oversee the visual exercises of the child. The object of this adjuvant treatment is to arouse and to re-establish binocular vision and consists in the use of atropin, monocular bandage, the correction of refractive errors, and exercises with stereoscope and amblyoscope and diploscope. The diploscope of Remy, of which there are two models, is fully described and directions for its use in orthoptic training are given. Furthermore an instrument devised by Terrien called the synoscope is explained, which in the author's hands has been useful in restoring simultaneous vision. In conclusion the authors believe that orthoptic treatment alone is nearly always insufficient in convergent strabismus, while in divergent strabismus the results are excellent. Orthoptic treatment, combined with operation gives very satisfactory results. The operation should be preceded by orthoptic treatment, to develop the binocular fusion faculty, and should be followed by it to maintain binocular vision.

A. K.

IX.—**Le Choix des Verres et de leurs Montures en Ophtalmologie. (The Selection of Glasses and their Mountings.)** By Dr. M. CAILLAUD. With ninety-two figures in the text. Pages 251. Paris: O. Doin et Fils, 1912. Price, Fr. 3.50.

This little book is designed for opticians and oculists and brings a great deal of useful information about the manufacture and grinding of glasses, their optical principles and defects, their mountings and proper adjustment. There is also a short chapter on artificial eyes.

A. K.

TO ILLUSTRATE DR. DUNN'S CASE OF VESSEL-FORMATION IN THE VITREOUS.